DOCUMENT RESUME

ED 186 384 SP 015 897

AUTHOR Klinzing-Eurich, Giesla; Klinzing, Hans Gerhard
TITLE Adaptation and Evaluation of Miniccurses in West Germany.
PUB DATE [79]
NOTE 106p.

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS *Minicourses; *Program Effectiveness; Program Evaluation; Relevance (Education); *Teacher Education; *Teaching Methods
IDENTIFIERS West Germany

ABSTRACT

This document describes the adaptation of an American inservice teacher training package to German teacher education programs. Far West Laboratory's "Minicourse Nine" was processed in two steps in order to field-test the material and to eliminate possible language inconsistencies. Difficulties in the transference of educational material from one sociocultural context to another are discussed. Results indicate that the minicourse method of inservice teacher instruction is effective in German as well as in American contexts, and guidelines are suggested for the future transfer of teacher education materials. (LH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED186384

Gisela Klinzing-Eurich/ Hans Gerhard Klinzing

Adaptation and Evaluation of Minicourses in West Germany

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Gisela Klinzing-Eurich

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Institut fuer Erziehungswissenschaft II
Zentrum fuer neue Lernverfahren

Universitaet Tuebingen
Muenzgasse 11
D 7400 Tuebingen

W.Germany

SP 015 892

Adaptation and Evaluation of Minicourses in West Germany

Gisela Klinzing/Eurich Hans Gerhard Klinzing

In West Germany Minicourse 9 was translated and adapted, and passed two revisions . The second German version was field tested in a pre test/post test/retention test/control group design with 29 elementary teachers and with 41 university graduates during their 1 1/2 year training period prior to full professional practice in secondary schools. The evaluation was carried out with a 59-item questionnaire and with the FIA categories, subdivided specifically into 27 and 17 categories, respectively, assessing the cognitive level of the teacher questions and - as an indicator for the quality of the interaction - the level of the particular corresponding student responses stimulated by them. Results indicate, that also in Germany a training according to this model is effective in most of its components and that different modes of instruction (perceptual versus symbolic) have no differential effect on the results. They also suggest guidelines for the German re-development of this material, for its implementation into the German teacher training system and for a future transfer of teacher training materials in Germany.

ADAPTATION AND EVALUATION OF MINICOURSES IN WEST GERMANY

Within the last two decades, approaches to teacher training, for example, like Microteaching, laboratory training, or Competency Based Education, have been of varying importance for teacher education. This seems to be evident from looking at the various publications dealing with teacher training, rather than from considering their role in the field, where they nevertheless continue to exert an important influence. The great number of articles published in American journals from the mid-1960's until the early 1970's, and dedicated to the possibilities and values inherent in such approaches,has shown an obvious decline. In contrast, other countries (for example, Great Britain or West Germany), and especially developing countries (Senegal, Ivory Coast, Nigeria etc., cf.Perlberg 1975) show an increasing interest in the topic.

Are Microteaching and related procedures comparable to many other methods in this field in that they cannot be sufficiently validated or successfully applied to practice? That these methods, under various names and in modified form, continue to be instrumental in ongoing teacher training programs in the U.S.A. and elsewhere, argues against this conclusion, as do the findings of approximately 60 studies, which imply that these methods have "(...)generated a more persistent, cumulative body of research than is available in most other systems (...)" (Peck/Tucker 1973). Furthermore, a series of studies (i.e., those at Stanford University and FWLERD, San Francisco) carried out on more general issues (Allen/Ryan 1969) suggested that these methods might be used as "research tools" (Allen/Ryan 1969), possibly leading to an integration of research and teacher training. The studies indicate that the subsiding scientific interest in the topic can hardly be blamed on a scarcity of research evidence or the applicability of the methods.

There are perhaps many other reasons which, although not discussed here, would surely be worthwhile to analyze. For example, the

disillusionment which follows unrealistic and often too demanding expectations, aroused during early stages of development by exaggerated propaganda, necessitated a critique which often tended to reject the entire approach. However, the reason is most likely to be found in the structure of institutionalized educational research. Scientific acclaim is more easily won, and careers more easily made, through the complete negation and rejection of past results, and through the creation of scientific "heresies". Less successful appears research whose results either support previous efforts or use them as a basis upon which to modify and improve.

In West Germany it was, above all, the Microteaching/Laboratory Training team at the Zentrum für neue Lernverfahren (ZNL) (1) which, in continuing the work accomplished by W. Zifreund (2) since 1965, concerned itself with the further development of such methods. Thus a model for pre- and inservice teaching was developed which, under the title "Training kommunikativer Fertigkeiten zur Gesprächsführung und für Unterricht" (TKF) (3) (Klinzing 1976; 1978; 1979; Klinzing-Eurich/Klinzing 1980), combined the Microteaching approach with interaction analysis.

---

(1) Universität Tübingen, Institut für Erziehungswissenschaft II. Zentrum für neue Lernverfahren, 7400 Tübingen, Deutschland. (University of Tübingen, Institute for Pedagogical Research II, Center for New Learning Methods, 7400 Tübingen, West Germany).

(2) W. Zifreund 1966, 1968, 1970, 1976.

(3) The training of interaction skills for classroom teaching as well as for all communicative situations.
The research reported here was partially supported by the Bundesministerium für Bildung und Wissenschaft (BMBW) (Federal Ministry for Education and Science), and by the Deutsche Forschungsgemeinschaft (German Research Association).

It aims at

- a systems approach to the learner's professional training,
- direct involvement of the learner in the function and role to be learned,
- offering the learner a framework and resources for self-initiated and self-directed learning.

With these goals in mind, the team is devoted to various research, development, and teaching activities which may be summarized as follows:

1. Research on procedures like SSST (Flanders 1970), Human Relationship Training (e.g. Gazda 1973), Microcounseling (Ivey 1972), Microteaching (Allen/Ryan 1969; Zifreund 1970), Minicourses Borg et al. 1970), etc.

2. Research and development of corresponding training materials for pre- and inservice teacher training on the basis of the research e.g. by Allen/Ryan, W. Zifreund, Borg et al. and Flanders, and within the outlines of the research and development cycle as suggested, for example, by W. Borg (1973) and G.E. Hemphill (1973). This happens through the adaptation of books and films (mostly originating in the U.S.) and through development of own materials (1).

---

(1) Development in four major steps:
1.) Decision-making as to the kind of Minicourses to be selected, based on a review of related research.
2.) Translation. Preliminary field test. Evaluation, primarily with the FIAC.
3.) Revision and adaptation to the German situation. Main field test. Evaluation, primarily with the FIAC.
4.) Re-development towards the TKF system.

The following training materials (all in the stage of field test versions) have been written in the form of the Minicourses at the FWLERD (Borg et al.1970), and adapted or re-developed for the TKF approach:

1.) Interaktionsanalyse (Interaction Analysis) (FIAC handbook and answer book) (adaptation) (FWLERD 1972; Klinzing 1972/73).
2.) Anfangsfertigkeiten des Fragestellens (Basic Questioning Skills) (re-development with Minicourse 1 as basis) (FWLERD 1970; Klinzing-Eurich/Klinzing 1975).
3.) Die Frage in Gespräch und Unterricht (Questioning in the Classroom and in other Communicative Situations) (re-development) (Klinzing-Eurich/Klinzing 1978).
4.) Das Eingehen auf Gedanken von Gesprächspartnern oder Schülern (Accepting and Using Discussions Group Members' and Students' Ideas; related to category 3 of the FIAC system) (re-development) (Klinzing 1974)
5.) Selbständiges Lernen (Organizing Independent Learning) (adaptation and re-development) (FWLERD 1973; Klinzing et al. 1975, re-development 1979)

3. Designing and conducting of Microteaching clinics at the ZNL as well as at teacher training institutions, many of these clinics being based on those materials. The clinics simultaneously serve the further explanation and improvement of both the proposed model and the training of pre- and inservice teachers.

One of the activities was the participation in the international project "The International Transfer of Microteaching Materials", within which Minicourse 9, developed at FWLERD (and focal point of this study) was translated, adapted, field-tested and evaluated.

The OECD/CERI Project for the Transfer of Minicourses

Within the framework of a OECD/CERI-coordinated project "The International Transfer of Microteaching Materials", Minicourses were adapted and tested since 1971, with the following goals in mind:

- inexpensive transfer of the materials, which were developed and researched at a high cost,
- at the same time training of educational researchers in the technique of transfer and development,
- acquisition of experiences concerning international transfer and development projects.

Practical work in the individual countries was realized with the following goals:

1) adaptation of teacher training systems developed and tested at the Far West Laboratory for Educational Research and Development in San Francisco,
2) testing of effectiveness of these materials in the individual countries, and comparison of the obtained results with already existing ones,
3) investigation and documentation of problems arising during transfer , and thus establishment of a reliable guide for the transfer of other products or methods.

One pilot study concerned, for example, with the transfer of Swedish mathematical materials (IMU) to Great Britain, Norway and Ireland, followed a series of conferences aimed at establishing a connection between educational research institutes and government agencies. They dealt with the conception of the project, its participants, and the acquisition of project funds. They took place in Dublin (Sept. 1971), Paris (Nov. 1971), and Tübingen (April 1972), (May 1972). Four Minicourses were presented at these conferences: two Minicourses concentrating on teacher oriented skills (Mc 1 and MC 9) and two other courses dealing rather with student oriented skills (MC 8 and MC 15).

Subsequently, seven university teams from six countries decided to cooperate, and the following steps were agreed upon:

1) selection of Minicourse to be adapted from the four recommended courses,
2) translation of the teachers' handbook,
3) revision of the films,
4) production of the films,
5) production of the final version of the films,
6) planning the test,
7) preliminary field test with 5-6 teachers,
8) assessment of the preliminary field test data and planning of the main field test,
9) realization of the main field test,
10) analysis of the data,
11) preparation of the final report,
12) final meeting of the project teams.

Minicourses were thus adapted, tested and evaluated in different countries from 1972 until 1975/6.
Although the participating countries (Holland, Great Britain, Sweden, West Germany, and France) (1) agreed upon an unanimous procedure

(1) Norway, and also Spain had withdrawn from the project in the meantime.

concerning the adaptation and testing of the materials, considerable differences came to light which stemmed from differing test conditions between the individual countries and particularly from the lack of communication between the project co-ordinator OECD/CERI and the project teams. These differences complicate a comparison of the individual results.The degree to which the adapted versions deviate from the original differs according to the individual country as do the modes of the evaluation. Generally,mostly positive results generally appeared where the project was fully completed (Sweden, Great Britain, West Germany, Holland (Leiden, Nijmegen)), not only with regard to the aimed-at behavioral changes, but also to the results of the questionnaires and to the observations of the project team during the course (cf. van Houten 1975).

At the same time, the work done in the transfer project had results in the individual countries that went considerably above and beyond the project framework. Thus, several teams planned the transfer of further Minicourses and further work on the Minicourse model, after the work was concluded. In the case of the German transfer the project was used in the development and testing of further independent training materials.

All in all, the results indicate that the transfer project was successful. Nevertheless, certain important goals were not,or not fully, reached:

- a reduction of the high initial development costs (an essential argument for the project) was only partially reached. A comparison between four test sites (Great Britain, Sweden, and two sites in Holland) proves that the transfer was scarcely cheaper than the original development. This was especially true in the case of MC 9, where decisive changes had to be made, leading to a rather independent new development (van Houten 1975, S. 228 f.);

- it must unfortunately be noted, that cooperation, or even a level of communication worth mentioning, scarcely existed between the individual test teams; sometimes, though,informal contact with the authors of the Minicourses did arise. Also, the meeting originally planned for the discussion of experiences gained during the course of the project never took place. The OECD/CERI did not, then, fulfil its function as mediator and co-ordinator, despite the verbose reports on the project published at intervals, but it denoted the actual progress of the project.

The following list provides details regarding the projects in the individual countries:

INFORMATION CONCERNING INSTITUTIONS PARTICIPATING IN THE OECD/CERI PROJECT (1)

INSTITUTION (2)	FUNDING	AMOUNT OF SUPPORT (Exchange rate 1972) Original development with evaluation at FWLERD is estimated at 120.000 U.S.Dollars (Borg 1972; compare also van Houten 1975)	INVESTIGATIONS
a) Minicourse I			
Catholic University (Netherlands) Nijmegen	Foundation of Research in Education. Institute of Education.	U.S. Dollars - Total 81.000	Preliminary field test 2 main field tests pre- and inservice
University of Lancaster (Great Britain)	Department of Education; OECD/CERI	U.S. Dollars - Total 96.000	Preliminary field test Main field test Retention test Preservice
University of Goteborg (Sweden)	Swedish Government	U.S. Dollars - 23.000; omitting wages of involved University staff	Preliminary field test Main field test Preservice
b) Minicourse 9			
University of Leiden (Netherlands)	———	U.S. Dollars - Total 81.000	Preliminary field test 2 main field tests Pre- and inservice
University of Tuebingen Center for New Learning Methods (West Germany)	BMBW (see above) University of Tuebingen	U.S. Dollars - 25.650 omitting wages of project leader from project section II (evaluation), and of involved co-workers (only for study I)	Preliminary field test 2 main field tests Retention test Pre- and inservice
Minicourse 9 + 15 University of Vincennes Paris VIII (France)	University of Vincennes	———	———

(1) according to C. van Houten

(2) Spain and Norway withdrew from the project.

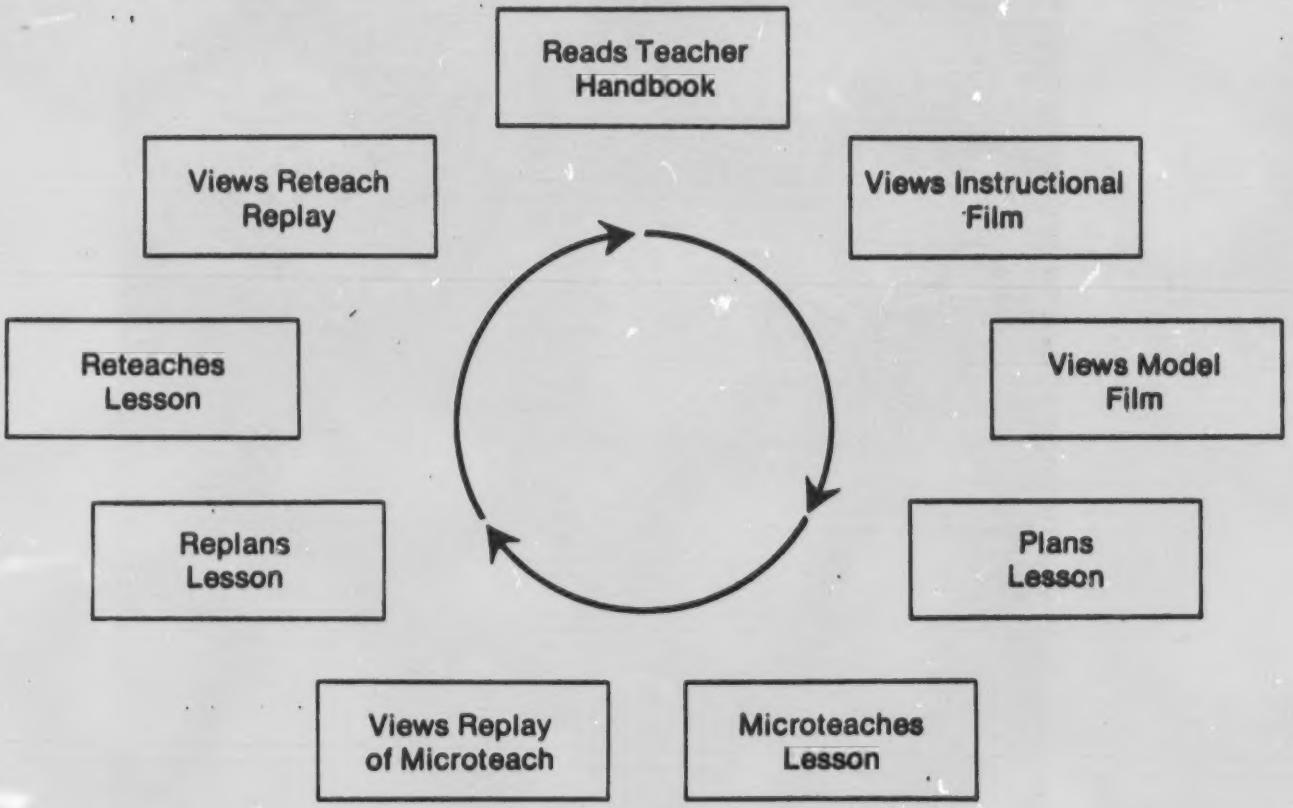
Two more teacher-oriented Minicourses (1 and 9) as well as two rather more pupil-oriented Minicourses (8 and 15) were planned for transfer within the framework of the project. The Center for New Learning Methods participated for West Germany in the transfer of Minicourse 9 and 15 (1). At the same time, this project inspired work with additional Minicourses, which were in the course of time redone or newly developed by the Microteaching/Laboratory Training team (see above).

The Original Version of Minicourse 9: "Higher Cognitive Questioning"

The Far West Laboratory for Educational Research and Development has developed a self-instructional material for inservice teacher training: Minicourse 9. It consists of an extensive (261 pages) teacher handbook, a coordinator handbook and 5 films (an introductory film, 3 instructional films which also contain model behavior, and a model film, which contains all question types). The course is based upon the elements of discrimination training combined with model-learning, practice in a Microteaching format (Allen/Ryan 1969), and feedback (via TV and evaluation forms). These elements are integrated into an instructional sequence, four of which the trainee goes through during his/her work with Minicourse 9:

(1) Project section II (Minicourse 15) will shortly be finished.

Teacher's Activities During
A Minicourse Instructional Sequence (1)



(1) Borg et al. 1970, p.29.

Minicourse 9 is designed "to increase the use of types of questions that help develop students' ability to think" (Mc 9, pg. 1). Thus, training is directed toward the increased use of higher cognitive questions and probing questions, intended to foster the pupil's thinking ability.

Following the taxonomy of cognitive objectives provided by B.S. Bloom (Bloom et al. 1956) higher cognitive questions are defined as questions which require from the pupil analysis, synthesis, and evaluation. Questions directed towards knowledge, comprehension, and application are called lower cognitive level questions. (For a summary of the types of questions see appendix I). The underlying assumption of this classification is that questions at a higher cognitive level are specifically suited to stimulate more complex thinking in the pupil, and "to induce him to think carefully and logically about a subject" (Mc 9, p. 17).

Probing questions would be questions asked by the teacher in response to inappropriate, unclear, incorrect, partially incomplete or short, unoriginal answers given by the pupil. The teacher would then attempt to qualitatively correct and develop these answers through the application of probing questions; he could ask the pupils to support their statements, to specify their responses, and to elaborate upon them, thereby stimulating the pupil to more complex thinking. Probing questions and higher cognitive questions have been dealt with in a series of studies, wherein positive correlations between these questions types and desirable pupil behavior (Rosenshine 1971; Dunkin/Biddle 1974) rather than between questions types and pupil achievement (Winne 1978; Dunkin/Biddle 1974, and in part Rosenshine 1971 etc.) were shown. For this reason, such questions are recommendable for training (cf. Gage/Berliner ^{2}1979. p.635ff.). Correlation studies show with relative consistence that pupils of teachers who ask these questions tend to give higher cognitive responses (cf. Rosenshine 1971; Dunkin/Biddle 1974, and the research report of Klinzing-Eurich/Klinzing 1980).

These objectives are distributed over the four lessons of Mc 9 as follows:

LESSON OBJECTIVES AND SKILLS (1)

Preliminary Lesson

Objective To introduce the first three question types in Bloom's taxonomy of cognitive objectives.

Skills Covered Writing and classifying *knowledge*, *comprehension*, and *application* questions.

LESSON 1

Objective To develop your skill in helping students improve the quality of their answers to higher cognitive questions.

Skills Covered Using performance criteria in order to judge student responses. Using probing questions to help students improve their answers.

LESSON 2

Objective To increase your use of *analysis* questions.

Skills Covered Asking three types of *analysis* questions:

1. Having students think of motives or causes to explain observed events.
2. Having students make inferences, interpretations, or generalizations.
3. Having students find evidence to support generalizations, interpretations, or conclusions.

LESSON 3

Objective To increase your use of *synthesis* questions.

Skills Covered Asking three types of *synthesis* questions:

1. Having students make predictions.
2. Having students solve problems.
3. Having students produce original communications.

LESSON 4

Objective To increase your use of *evaluation* questions.

Skills Covered Asking four types of *evaluation* questions:

1. Having students give their opinions about issues.
2. Having students judge the validity of ideas.
3. Having students judge the merit of problem-solutions.
4. Having students judge the quality of art and other products.

(1) MC 1, p.6f.

The four question types in Minicourse 9 are first discussed in a brief research review concerning teaching questions in general, and specifically questions at a higher cognitive level; examples are then provided as clarification. Then the single question types are to be formulated in written exercises, and they are to be discriminated on the basis of transcripts. In practical exercises, formulated from very concrete suggestions, the questions are practiced in a series of exercises, consisting of a 10-15 minute teach, and a comparable reteach with small groups of pupils. All teaches and reteaches are recorded with TV and evaluated by the teacher himself on the basis of this record, aided by very simple evaluation forms attached to the handbook. The work with Minicourse 9 proved to be very effective from several studies concerning various forms of training, but especially in the form suggested in the original version (Gall/Dunning/Galassi/Banks 1970; Acheson/Tucker 1971; Acheson/Zigler 1971; Gall/Dunning/Banks/Galassi 1972; Gall/Saunders/Nielson/Smith 1974).

The German Version of MC 9: "Minikurs 9: Die Technik der Frage höherer Ordnung" (MK 9)

Adaptation

Minicourse 9 was transferred into German in two steps. A first test version (1) served as a basis for a preliminary field test with a few teachers and teacher trainers, whose critiques and suggestions went into the revision of the first test version. The revised version was then tested and evaluated in the main field test (see below). This division of the adaptation into two steps may seem unnecessary but possible difficulties and inconsistencies in the text of the teacher's handbook (which could perhaps produce negative attitudes toward the material) had to be eliminated.

---

(1) The first test version was written by R. Löffler and M. Vogel under the direction of H.J. Krumm, and in discussion with co-workers of the entire project (see Krumm 1972; Löffler 1972). The revision of the first test version along with the preliminary field test and the main field test was undertaken by the authoress.

In translating teaching materials from one language into another, and from one socio-cultural context to another, problems arise. These problems are different from those arising from the translation of textbooks, news, technical or scientific texts, although material such as Minicourse 9 is treated as belonging to the last group. In the numerous publications regarding theories of translation (compare, for example, Störig (ed.) 1973) which, however, are primarily concerned with the translation of theological or poetic texts, such difficulties are usually discussed from the perspective of "accuracy in translation"; the relationship that the translation can and should have to the original, is discussed. With texts concerned with the representation of facts, observations of facts, etc. a transfer which remains true to the original seems unproblematic; this is particulary so when the language into which the material is being transferred has a corresponding vocabulary and conceptual structure, or if these can easily be developed. The more concrete the text is and the less room for interpretation there is (either due to the topic itself, or the way the author presents it to his readers), the closer the translator can stay to the original material. This does not mean that one must follow the original wording; rather one uses the contents of the sentence or of a unit larger than a sentence as a basis, in accordance with the laws of that language. In this case it is essential that all the data and facts, and their relative importance be rendered in a dependable, precise, understandable,and complete manner. In texts which contain different interpretations and evaluations of facts, observations, etc., and in which the form, diction,and conveyance of meaning play an important role, the translator becomes rather a <u>mediator</u> between the original material and his public. The conception of translation accuracy must be redefined here, particularly with respect to poetic texts. In this case, it has to be decided if the priority is the informational content, on the aesthetic qualities of rhythm and sound and the associations thereby created in the reader. If the translator works according to the principle of remaining accurate to the original, then he must convey both form and context equally into the other language. He will hardly be able to preserve all the essential qualities, because the language he is translating into will not allow it. He must decide upon what he foremost

wishes to convey, so that he can present the work to his readers with as little loss as possible. Even so, a translation may appear reliable from one viewpoint; from another viewpoint, although good in itself, less reliable. To take the matter to an extreme an interlinear version is certainly more reliable than a congenial free version, with regard to the text. Still, the latter may preserve a greater degree of loyalty to the original version, while losing certain features of the work. Teaching materials lie at the center of this continuum, wherein the interpretation of accuracy depends upon the type of text involved: an exact reproduction of the literal sense is less important than an accurate rendition of the materials' intentions.

With that, however, a further dimension must be taken into account. J.W.v. Goethe (1813, see Störig, page 35) discriminated between two maxims of translation:

> "There are two maxims of translation: the one demands that the author of a foreign country be brought to us in such a manner that we regard him as our own; in contrast, the other maxim demands that we go to the foreign and experience its circumstances, manner of expression, and peculiarities. The merits of both are well-known to all cultured people through examples".

The transfer of teaching materials should follow the first maxim. The materials were specificially developed with regard to their public to a greater degree than were technical, scientific, or poetic texts. They are concerned more with the attainment of specific intentions, of concrete effects upon the readers, than with the attainment of a familiarity with the peculiarities of the text's form and content. If a transfer is to be more than an acquaintance with, and discussion of, the text's form and context among "experts", then (just as the original is obligated to its readers) it must also be committed to its new audience. This holds especially for teaching materials such as Minicourses, wherein the concern is not actually the conveyance of information, but the building up of teaching competencies. Thus, the obligation to the audience has to be added to the dimension of the concept of "faithfulness to the original". To ensure this, materials such as the Minicourses should be adjusted to the educational context, learning habits, experiences, knowledge, and objectives of the readers, and also to their professional situation, wherein the course is to be

effective.

It was not fully realized at the beginning of the Minicourse project that the transfer of teaching material, more than that of other texts, has to serve the principle of efficiency rather than of literal accuracy. It was assumed that a professional translator could be entrusted with translating the information parts, and that later a staff member would re-work the model lessons (cf. Löffler 1972). This procedure seemed to be in line with the agreement among the other cooperating partners, who initially believed that in order to ensure a comparable adaptation of the materials among the various countries, one must follow the original version as closely as possible, without regard to the varying contexts. However, it soon became evident, that it was impossible to harmonize the attitude of the professional translator (who adheres to textual accuracy) with the maxim of appropriateness of the teaching material to the reader. Such a procedure was developed; the informational parts of the Minicourse were translated by a staff member, and discussed by a committee of the project team. Although this solution was certainly an improvement, it became increasingly apparent that a dialogue with the teachers in the field, i.e. with the teachers to whom the Minicourse skills are directed, was unavoidable. Therefore, the group that was evaluate the Minicourse decided that, before the material be submitted to a main field test, they would gain experience in a preliminary field test.

Testing

A preliminary field test was given to 10 teachers from various types and levels of schools. The teachers were asked to read the handbook. The opinions of the teachers on individual aspects of the handbook were assessed through interviews and questionnaires. In this way, information concerning the general problems of adaptation and implementation was gathered. Information concerning the problems and shortcomings in format and style of the handbook, as well as the different expectations and working habits of German, as opposed to American adressees, etc., was obtained as well. In the following (second) revision changes were undertaken only insofar as they did not prevent the comparison of the revised material with the project partners' ones. The number of accompanying films was reduced from five to three because of organizational and financial difficulties. The context of the films was adapted in some parts, synchronized in others.

This second revision of Minicourse 9 (one handbook, 2 model films, and one introductory film) was main field tested in several "Grund- und Hauptschulen" (schools for pupils from 6 - 15) (study I) and in a "Studienseminar" (teacher training seminar for secondary teacher candidates) (study II),and was evaluated with respect to the attitudes of the teachers to the training material, their work with the course and the basic Microteaching methods as well as to the changes of behavior in the teachers and students.

Questions and Hypotheses for the Main Field Test

The central questions which formed the basis of the evaluation of Minicourse 9 using "Grund- und Hauptschule"teachers (study I) or using secondary teacher candidates (study II), were as follows:

-Are the objectives of Minikurs 9, of a self-study material transferred into German, reached by teachers in West Germany, and can an eventual teacher progress be observed three months after the end of the course (study I)?

-How do the teachers who have worked with MK 9 evaluate their own progress, the material, and its components (study I and II) ?

-What additional changes occur in the teachers from the MK 9-training (study I and II) ?

-What behavioral changes occur in the pupils of the teachers who participated in the MK 9 training (study I and II) ?

-Is training with MK 9 without model films effective, simply using the transcripts of these films (study on different modes of presentation of the models, Study I) ?

Provided the course be effective, the answers to these questions should form the basis of the decision regarding how it can be implemented, in either a revised or original form into teacher training in West Germany.

Hence the study of the training materials relates to the following hypotheses:

Study I:

A.) Hypotheses related to the MK 9 course objectives (variables 1 and 2)(1)

a) As a consequence of training with MK 9, the teachers ask a significantly higher portion of :

- higher cognitive questions
- probing questions

during classroom discussion .

b) As compared to the post test, no significant difference exists with these teachers during classroom discussion three months after the course ends in the portion of

- higher cognitive questions
- probing questions.

c) As compared to the pre test a significantly higher portion of

- higher cognitive questions
- probing questions

will be asked by the teachers during classroom discussion three months after the course ends.

d) Teachers, who have worked through the course, give positive evaluations of the course and its components.

B.) Hypotheses concerning additional changes in teacher variables through the training with MK 9 (variables 3 and 4)

a) As a consequence of training with MK 9, these teachers use significantly more behaviors of indirect influence as defined by N.A. Flanders (1970)

b) As compared to the post test,no significant difference exists in the portion of behaviors of indirect influence , three months after the course ends, with these teachers during classroom discussion.

---

(1) For a synopsis of the variables defined for evaluation see p. 22

c) As compared to the pre test, these teachers show significantly more behaviors of indirect influence during classroom discussion three months after the course ends.

C.) Hypotheses concerning changes in directly observable student behavior (variables 5 to 14)

a) As a consequence of training with MK 9 pupils of the teachers who have gone through the course show during classroom discussion significantly:

- more responses
- more longer responses
- more higher cognitive responses
- more initiative
- more responses on the same cognitive level as the preceding question
- more responses to higher cognitive questions
- longer responses to higher cognitive questions
- more higher cognitive responses to higher cognitive questions.

b) As compared to the post test, three months after the course ends pupils of these teachers show no significant difference during classroom discussion in these variables:

- number of pupil responses
- length of pupil responses
- portion of higher cognitive responses
- student initiative
- portion of pupil responses on the same cognitive level as the preceding question
- number of pupil responses to higher cognitive questions
- length of pupil responses to higher cognitive questions
- number of higher cognitive pupil responses to higher cognitive questions.

c) As compared to the pre test, three months after the course ends pupils of these teachers show during classroom discussion significantly:

- more responses
- more longer responses
- more higher cognitive responses
- more initiative
- more responses on the same level as the preceding question
- more responses to higher cognitive questions
- longer responses to higher cognitive questions
- more higher cognitive responses to higher cognitive questions.

D.) Hypotheses concerning behavioral changes in connection with different modes of presentation of model in MK 9 (variables 1 to 14)

a.) As a consequence of training with MK 9 the teachers show no significant differences during classroom discussion, in the behavioral changes from the pre- to post-test between these groups of teachers:

- teachers who saw the teaching model on videotape and who worked through its transcripts (video group), and
- teachers who only worked through the transcripts of these tapes (reading group),

in the following variables:

- portion of higher cognitive questions
- portion of probing questions
- portion of teacher behaviors of indirect influence
- number of higher cognitive pupil responses
- length of pupil responses
- portion of higher cognitive pupil responses
- portion of pupil initiative
- portion of pupil responses on the same cognitive level as the preceding question
- number of pupil responses to higher cognitive questions
- length of higher cognitive pupil responses
- number of higher cognitive pupil responses to higher cognitive questions.

b.) As compared to the post test no significant differences appear three months after the end of the course, during classroom discussion, with these teachers and their pupils, in these variables:

- portion of higher cognitive questions
- portion of probing questions
- portion of teacher behaviors of indirect influence
- number of higher cognitive pupil responses
- length of pupil responses
- portion of higher cognitive pupil responses
- portion of pupil initiative
- portion of pupil responses on the same cognitive level as the preceding question
- number of pupil responses to higher cognitive questions
- length of higher cognitive pupil responses
- number of higher cognitive pupil responses to higher cognitive questions.

c.) As compared to the pre test, no significant differences appear three months after the end of the course, during classroom discussion, with these teachers and their pupils, in these variables.

- portion of higher cognitive questions
- portion of probing questions
- portion of teacher behaviors of indirect influence
- number of higher cognitive pupil responses
- length of pupil responses
- portion of higher cognitive pupil responses
- portion of pupil initiative
- portion of pupil responses on the same level as the preceding question
- number of pupil responses to higher cognitive questions
- length of higher cognitive pupil responses
- number of higher cognitive pupil responses to higher cognitive questions.

d.) After the course, no significant difference exists in the attitude to the course and its components between the group of teachers that has seen the teaching model on videotape and worked through its transcriptions, and the group that has only worked through the transcripts.

Study II

A.) Hypotheses related to the MK 9 course objectives (variables 1 and 2)(1)

As a result of training with MK 9, teachers ask a significantly higher portion of

- higher cognitive questions
- probing questions

during classroom discussion.

Those teachers who have worked through the course give positive evaluations of the course and its components.

---

(1) For a synopsis of the variables defined to test these hypotheses see p. 22.

B.) Hypotheses concerning additional changes in teacher variables through training with MK 9 (variables 3 and 4)

As a result of training with MK 9, teachers use significantly more behaviors of indirect influence during classroom discussion.

C.) Hypotheses comparing changes in directly observable pupil behavior (variables 5 to 14)

As a result of training with MK 9, pupils of the teachers who have gone through the course show significantly

- more responses
- more longer responses
- more higher cocnitive responses
- more initiative
- more responses on the same cognitive level as the preceding question
- more responses to higher cognitive questions
- longer responses to higher cognitive questions
- more higher cognitive responses to higher cognitive questions.

Synopsis of the variables defined for the studies (1)

1.) Proportion of higher cognitive questions to all cognitive questions (in percent)

2.) Proportion of probing questions within the total time of interaction (in percent of all coded units)

3.) Indirect/direct teacher influence (IDR: Indirect/Direct Ratio)(2)

4.) Teacher response (TRR: Teacher Response Ratio) (2)

5.) Pupil talk (PTR: Pupil Talk Ratio)(2)

6.) Mean number of cognitive pupil talk

7.) Proportion of pupil talk of three (3-second-)units or more to all pupil talk (in percent)

8.) Pupil talk following pupil talk of the same category (PSSR: Pupil Steady State Ratio)(2)

9.) Proportion of higher cognitive pupil talk to all pupil talk (in percent)

10.) Pupil initiative/ pupil reaction (PIR: Pupil Initiation Ratio)(2)

11.) Proportion of pupil talk on the same cognitive level as the preceeding question (in percent of all cognitive pupil talk)

12.) Mean number of pupil talk following higher cognitive questions

13.) Mean length of pupil talk following higher cognitive questions (in units of three seconds)

14.) Mean number of higher cognitive pupil talk following higher cognitive questions

---

(1) The exact definition of the variables is reported in the section "Results"

(2) Flanders 1970

Method

Sample study I

The study was carried out in co-operation with four teacher training seminars for teachers of different types of schools (Bezirksseminare für das Lehramt an Grund- und Hauptschulen, Studienseminare). These institutions organized meetings on "New Methods of Pre- and Inservice Teacher Training". At these meetings, where mainly Microteaching procedures were discussed, the goals and methods of Minicourses were introduced. 107 teachers expressed their general interest in participating in a Minicourse training. After a detailed discussion of the expenditure for rooms, technical equipment, time, and extra work during the course, 65 participants felt unable to work with a Minicourse. Organizational problems and over-work were the reasons, especially since it was impossible for them to avoid school duties and other obligations. For example, among these 65 participants were junior teachers who were soon to write examinations, and teachers from an experimental school; only a few of those could agree to increase their professional or examination work-load by working with the course. Their number soon declined to the extent that a try-out of a Minicourse for these two groups was dropped. A group of 42 participants began with the training, carried out the pre tests, and was randomly divided into two groups, a video and a reading group (see below). Four participants from these groups could not carry out all microteaches due to school-organizational reasons; they were therefore removed from the study. In the case of nine other participants either a test was missing, or the tape recording of a pre- and/or post-test was of such poor sound quality that an accurate evaluation was impossible.

After three months, only 14 of the remaining 29 participants were available for a retention test; they were still at the same schools and had the same pupils at their disposal for the retention test, as they had at the time of pre and post test.
From the teachers originally interested in MK 9,16 (initially 17) were ready to undergo the same type of pre- and post test as the teachers participating in the training. They serve as a comparison group (non-equivalent control group).

Despite the voluntary nature of the participants, and despite the withdrawing of some of them (due essentially to organizational reasons) there is no reason to suppose that differences among the participants exist, which might distinguish the experimental group from the control group, the 14 retention test members from those who did not undergo this test, or the video group from the reading group.

Also U-tests have been made for the comparisons between the experimental and comparison group, between the retention test group and the group that did not participate therein, and between the reading and video group for the pre test. The tests confirm the similarities of the groups.

The following table contains personal data of all participants.

TEACHERS INTERESTED IN LEARNING WITH MK 9

STUDY I

1. Teachers interested in Microteaching methods, especially in Minicourses	n	Study: Grund- und Hauptschule (pupils of the age of 6-16) n	Study: Studienreferendare (secondary school teacher candidates) n	Age $\bar{x}$	Age $\bar{x}$	Years of service $\bar{x}$	Years of service $\bar{x}$	Sex m	Sex f
	107	83	24	29.3	5.6	4.0	3.9	67	40

	n	Age $\bar{x}$	Age s	Years of service $\bar{x}$	Years of service s	Sex m	Sex f
2 a.) From those, teachers ready to co-operate, and who worked through the course	42	28.8	4.4	3.6	2.8	27	15
From those, teachers who completely worked through all training sequences, and for whom full data exist	29 (17 +12)	29.2	4.2	4.0	1.6	21	8
b.) From those, teachers available for a retention test	14	29.9	4.0	4.3	3.0	13	1
c.) Teachers from the 107 interested, who although unable to work through the course, were available for a pre- and post test (comparison group)	16	28.3	4.9	5.7	6.3	6	10

Sample Study II

51 university graduates ("Studienreferendare") (28 male, 23 female, aged 23-32) selected this course from those offered by their teacher training institution during their 1 1/2 year training period prior to full professional practice at secondary schools (pupils aged 10-19). With a few exceptions, they had already obtained some teaching experience during their training period, usually with pupils aged 10-16.

The following table gives a synopsis of the subjects the participants had studied at university:

SUMMARY OF THE SUBJECTS STUDIED AT UNIVERSITY

Mathematics, natural science (Biology, Physics, Chemistry, Mathematics) 12	Literature, Languages, History, Politics, Theology 14	Combination of a natural science subject and a philological subject 3	Music (in combination with a philological or mathematical/natural science subject 2
Geography (in combination with a natural science (2) or a philological subject (6) 8	Sport (in combination with a natural science (2) or a philological subject (4) 8	No data 4	

From the 51 participants, only 46 questionnaires and 41 tape-recordings of their pre- and post-tests could be included in the evaluation. The missing questionnaires were either not sent or incompletely filled out. With the exception of three cases (wherein the pre- or post-test had to be left undone because of organizational reasons) the participants themselves made the tape-recordings without the aid of technicians or staff members with tape-recorders and microphones of varying quality. The recordings of seven participants could not be coded because of recording errors in the pre- and post-test. Despite the voluntary nature of the participants, and despite the withdrawing of some of them (resulting essentially from organizational and technical problems) there is no reason to believe that the participating group differs from other teacher trainees in its composition.

Design and Treatment, Study I

The aim of this study was the testing of MK 9 under normal practice conditions. For this reason, experimental conditions were to approach those of applied practice as nearly as possible. However, since two members of the evaluation team participated in the organization of the course (mainly in the preparation of the video equipment for the training sequences), the test may be classified between a main field test and an operational field test.

A pre test/post test/retention test/comparison group design was used.

This design which could be characterized as "quasi-experimental" (Campbell/Stanley 1963), can be represented with the following diagram:

Experimental Groups	O_1 O_1	X_2 X_2	$O_2 \dashrightarrow O_3$ O_2
Comparison Group	O_1		O_2

O_1 - Observation during the pre test
O_2 - Observation during the post test
O_3 - Observation during the retention test
X_1 - MK 9-training with model films (video group)
X_2 - MK 9-training without model films (reading group)

As far as the treatment of the experimental group was concerned, the participants worked through the handbook, group 1 (X_1) was additionally provided with two video films, and all the participants carried out four Microteaching sequences, each one consisting of teach, evaluation, reteach, and evaluation as scheduled in the handbook.

The comparison group did not undergo any comparable treatment (0-comparison group). Also, no special treatment occured between the post test and retention test.

All participants of the experiment, i.e., those of the two experimental groups and those of the comparison group, were aware of the main goals of MK 9 (cf. Hypotheses A.a.). The learning goals for each chapter of MK 9 were handed out to the teachers; this was done to avoid behavioral changes perhaps resulting from their unawareness of what actually was expected of them during the pre test. They also received instruction as to the realization of the test, teaching skills, and the question classification (according to Bloom's taxonomy). An introductory film portraying each question type provided the group for discussion. Thus, all the participants learned under which categories (higher order questions, probing questions) their behavior was to be evaluated.

Tests, study I

During the next 1-2 weeks, all 42 participants did the pre tests, following the instructions. The 16 (17) participants from the comparison group who were interested, but unable to participate, also did the pre test. The teachers gave a 20 minute lecture, based upon a freely chosen text, to 15 pupils randomly selected from their classes. In some cases, the lecture was based upon either an explicit blackboard account, or a tape-recording, working papers, etc. (1). This lecture was recorded by the teachers and served as the pre test.

---

(1) These sources of information were later made available for the evaluation of the tests. Thus, it was easier to distinguish the given information from the results obtained from the lecture (see below).

After that, the experimental group was randomly divided into two subgroups. The participants of the video group (n = 17) went through the handbook, and watched the corresponding video films as suggested in the handbook. The video films portrayed the skills through question-answer-sequences; inserts indicated the respective type of question. There were two films, one which focused upon synthesis questions (16:35 minutes), and one which focused upon evaluation questions (20:35 minutes). The latter could be watched several times under various aspects because it portrayed the question types within the larger framework of an actual lesson. This film contained all types of questions. In addition, the participants worked through the transcripts of these films in the handbook; they had to classify these questions asked by the teacher, and compare their own solutions with the suggestions the teacher, and compare their own solutions with the suggestions in the handbook. In the meantime the other group (reading group, n = 12) only worked through the transcripts in the same manner as explained above. Then the participants of the whole experimental group (n = 29) applied the course in their own schools. They went through four Microteaching sequences (teach-self evaluation based on the video recording using the handbook evaluation forms - reteach - self-evaluation). One sequence dealt with probing questions, one with analysis questions, one with synthesis questions, and one with evaluation questions. This was carried out with small groups of 5 to 7 pupils from their own classes. The participants themselves chose the time, location and duration of their training, as the Mini-courses intend. Consequently, the duration of the course varied from 30 to 50 hours. In the course of their work, some of the participants formed small groups of 2 or 3, in order to prepare and evaluate together. Apart from providing the participants with materials and equipment, the task of two members of the evaluation staff was to carefully observe the ongoing training, without interfering.

The comparison group did not undergo any comparable training.

At the end of the course the participants of the experimental group and comparison group did a post test under the same test conditions and with the same group of pupils as in the pre-test. A different topic, chosen from the same general subject area, was used. After the last participant had finished the post-test, a final meeting took place; this meeting was intended for critical purposes, and lasted about 2 1/2 hours. There, a questionnaire had to be filled out in order to obtain the participants' opinion about course content and organization. A discussion then followed, where further aspects of the course were criticized.

Three months after this final meeting 14 of the 29 participants for whom all the data were at hand (i.e. pre-tests, post-tests, questionnaires, personal data) were available for a retention test. After having once again realized the course goals, they underwent this test under the same conditions and with the same pupils as the pre- and the post tests.

The following graph shows the design of study I.

COURSE DESIGN

Study I

Duration	Experimental Group	n	Comparison Group	n
	Introductory session -course contents and objectives -organisation	107	Introductional session -course contents and objectives -organisation	
1-2 weeks	PRETEST (20 minutes) (1)	42	PRETEST (20 minutes) (1)	17
5-7 weeks	-Working with handbook individually (including 4 Micro-teaching sequences) n = 17 : video films + transcripts n = 12 : transcripts only	29 (17/12)		
	POSTTEST (20 minutes) (1)	29 (17/12)	POSTTEST (20 minutes) (1)	
0-2 weeks	FINAL MEETING (attitude questionnaire on the course prior to general discussion)	29 (17/12)		
3 months	RETENTION TEST (20 minutes) (1)	14		

(1) The first 14 minutes were coded.

Design and Treatment, Study II

As with study I, the replication study aimed at the testing of MK 9 under the normal training conditions of a teacher training seminar for postgraduate secondary teacher candidates. The course was conducted without the help of the ZNL staff; accordingly, the investigation is to be classified as an operational field test (Borg et al. 1970). The study was carried out in a pre test/post test design (0x0) since, on the basis of the results of study I and other inverstigations (cf. Borg et al. 1970), it can be assumed that because of the high degree of stability in teaching behavior, changes in this behavior can essentially be traced back to the special training.

The treatment differed from study I in some partly essential points. In contrast to the video group of study I, the beginning secondary school teachers worked solely with the printed material in the handbooks (like the reading group of study I). The working through of the material took place over 4 months roughly, in seminars each of which lasted 1 1/2 hours. The work was done either individually or in groups, and in combiration with weekly plenary sessions. For organizational reasons the micro-teaches were reduced in number. They were conducted without reteaches. Hence, not counting the pre and post tests, each participant in the average did only 4 micro-teaches. And those 4 lessons could not be taught by all participants, because of organizational reasons.

In contrast to study I, the evaluation of the microteaches was based solely upon tape recordings; this evaluation was undertaken either individually, in groups, or in seminar sessions, where individual teaches were discussed in plenary sessions. Several participants complained that the time available was not enough to complete the handbook assignments. The micro-teaches, then, often were only superficially evaluated.

Tests, study II

As with study I, before the pre test all participants were familiarized with the two main goals of MK 9, and with the organization of the course.

The pre tests were conducted with 15 randomly chosen pupils within the framework of classroom discussions. These tests lasting about 15 minutes each, were based on texts, blackboard accounts, etc freely chosen by the participants. As previously mentioned, the student teachers tape-recorded these sessions.

After the completion of the course, a post test was conducted under the same conditions as the pre tests, with the same pupils, and using a topic from the same subject area. In a concluding critical session questionnaires were filled out and the course was critically discussed.

Methods of Data Collection

As far as the range of recorded behavioral changes is concerned, in decisive points the ~~study~~ went beyond the questions and hypotheses set up for the original version of MK 9. In the American investigations (on the basis of transcripts of the tests), effectiveness of training was measured essentially by the increased use of the respective teaching skills (higher percentage of higher cognitive questions and higher frequency of probing questions), and by two student variables (quantity and length of student responses). The evaluation of MK 9 - in the sense of Process-Process-Research (1) - attempted to get more differentiated results by collecting data for directly observable behavioral changes in both teachers and pupils. For this purpose, the 10 categories of Flanders' Interaction Analysis System (FIAC) (2) were used and expanded to 27 categories (study I) or to 17 categories, respectively (study II).

Thus, information of the most varying nature could be obtained:
on the one hand, information concerning the attainment or non-attainment of the MK 9 objectives (see above, hypothesis A, a.), and concerning the long term effect of the training (hypothesis A, b and c.). Information could also be obtained concerning the additional effects (and long term effects, hypothesis B, b and c) of the changes which were aimed at by training with the material, in an interaction context as assessed with the modified FIAC-system (hypothesis B,a.).

(1) cf. Dunkin/Biddle 1974; Doyle 1975; Klinzing/Klinzing-Eurich 1979
(2) Flanders 1965; Amidon/Flanders 1967; Flanders 1970

Information extending beyond the pure training-evaluation itself could be obtained; i.e., regarding the effects of individual teaching methods on directly observable student behavior (hypothesis group C). Again the long term effect was measured (hypothesis C, b and c). This seems particularly important in terms of the overall framework of the development of training material, as well as of the investigation of generally relevant teaching problems.

Within teacher education, especially when procedural elements of it (as, for example, Microteaching) are designed in analogy to sociological experiments, there is the additional possibility of investigating research questions of a more general significance. Thus, not only the interrelationship (cf. Allen/ Ryan 1969) between the changes of behavior in teachers and students(still closely connected with the evaluation of the Minicourses) was investigated but also the effects of various modes of presentation for the models (audiovisual and symbolic, versus symbolic) (hypothesis group D, a.); again, the long term effect of the changes were measured (D, b and c).
In addition, the participants were given a 59-item questionnaire on the course, its objectives, its components, its method, its effects, etc., and the course was (as were the other evaluations) continuously accompanied by interviews and discussions between the organizers and the participants (hypothesis A, d)(1).

Study I

In this study, the cognitive levels of Bloom's taxonomy were employed as subcategories of the teacher question (category 4) and of the student utterances (category 8 and 9).

In this way, all cognitive levels were used as subcategories of category 4 of the FIAC:

Cat. 41 - knowledge questions
Cat. 42 - comprehension questions } lower level questions
Cat. 43 - application questions

Cat. 44 - analysis questions
Cat. 45 - synthesis questions } higher level questions
Cat. 46 - evaluation questions

(1) Due to brevity of this article, the results of this questionnaire cannot be reported here. In general, they reveal positive to very positive ratings in most of the items.

Teacher questions which are not classifiable according to their cognitive level, or which do not relate to the lesson subject (as well as managerial questions) are classified as category 40.

In contrast to the classification rules set up by the FIAC system (cf. for example Amidon/Flanders 1967), the classification of the 6 subcategories, ranging from knowledge qeustions to evaluation questions is determined, not by what the observer feels as being the effect of the specific teacher behavior on the pupil (otherwise "praise" (category 2) is recorded when the observer estimates the utterance as having an effect of praise on the student), but by the teacher's intention as estimated by the observer.

Applied to student behavior, the three lower cognitive levels of Bloom's taxonomy became subcategories of category 8 of the FIAC because the levels refer to a reactive, rather than an initiative type of thinking. The three higher levels became subcategories of category 9 because they refer to a more initiative type of cognitive process (1).

Cat. 81 - pupil's answer on the knowledge level
Cat. 82 - pupil's answer on the comprehensive level } lower level of pupil's answers
Cat. 83 - pupil's answer on the application level

Cat. 94 - pupil's answer on the analysis level
Cat. 95 - pupil's answer on the synthesis level } higher level of pupil's answers
Cat. 96 - pupil's answer on the evaluation level

Just as with the teacher questions, those student responses which either cannot be classified according to their cognitive level, or do not relate to the lesson subject (e.g. rather to classroom management) are classified as category 80 or 90. Student questions are classified as 87 or 97.

The following table presents the FIAC categories and subcategories for study I.

---

(1) Thus, the cognitive level of the student answer is classified independent of the level of the preceding teacher question, since both need not necessarily always be concurrent. It is precisely this correspondance or lack of correspondance which can serve as an indicator for the quality and type of interaction (see below).

The FIAC Categories and Subcategories

Study I

		27 cat.	10 cat.
Silence Confusion		01. :Ten convention 02. :Silence 03. :Confusion	0
Teacher Talk	Response	10. :Accepts feelings	1
		20. :Praises or encourages	2
		30. :Accepts or uses ideas of students 31. :Probing questions	3
		40. :Asks questions (classroom management etc.) 41. :Knowledge questions 42. :Comprehension questions 43. :Application questions 44. :Analysis questions 45. :Synthesis questions 46. :Evaluation questions	4
	Initiation	50. :Lectures	5
		60. :Gives directions	6
		70. :Criticizes student or justifies authority	7
Student Talk	Response	80. :Student talk -response (classroom management or unidentifiable level) 81. :Student talk-resp., knowledge level 82. :Student talk-resp., comprehension level 83. :Student talk-resp., application level 87. :Student asks questions in reaction to the teacher	8
	Initiation	90. :Student talk - initiative, classroom management or unidentifiable level 94. :Student talk - initiative, analysis level 95. :Student talk - initiative, synthesis level 96. :Student talk - initiative, evaluation level 97. :Student asks questions, initiative	9

Study II

For study II, the category system was simplified.
The following table shows the

LIST OF THE FIAC CATEGORIES AND SUBCATEGORIES

STUDY II

	cat.	
Teacher talk	10	Acceptance of feelings
	20	Praise/encouragement
	30	Acceptance and use of students' ideas
	31	Probing questions
	40	Questions-managerial
	41	Lower order questions
	44	Higher order questions
	50	Lecturing
	60	Giving directions
	70	Criticism
Student talk	80	Student talk-response-others (managerial, feelings etc.)
	81	Student talk-lower order cognitive - response
	87	Student talk-response-questions
	90	Student talk-initiative-others (managerial, feelings etc.)
	94	Student talk-higher order cognitive - initiative
	97	Student talk-initiative-questions
	01	Silence/confusion
	00	Ten convention

Observer reliability

Two observers trained carefully with criterion material coded all audiotapes of pre- and post-tests with the expanded FIAC system. Since frequencies as well as sequences of categories were the basis of evaluation, observer agreement and observer stability were measured in two different ways:

- as the agreement of units (unit by unit with the modified Scott-Coefficient, Flanders 1967) and
- as the sequence by sequence agreement of chains of equal categories (percentage agreement).

The following tables show observer agreement and stability for both studies.

Study I:

Observer agreement and stability for 25 categories and for 17 main categories of the expanded FIAC system for two 14 minute classroom discussions.

Modified Scott-Coefficient for units and percentage agreement for sequences of chains of categories.

	Observer Agreement		Observer Stability	
	Discussion 1	Discussion 2	Observer 1	Observer 2
Scott Coefficient for 25 FIA-Categories (frequencies of categories)	π= 0.75	π= 0.87	0.89	0.72
Scott Coefficient for 17 FIA-Categories (frequencies)	π= 0.85	π= 0.91	0.92	0.87
Percentage agreement for 25 FIA-Categories (sequence by sequence agreements of chains of categories)	72.41 %	77.46 %	π=81.41 %	π=84.31 %
Percentage agreement for 17 FIA-Categories (sequence by sequence agreement of chains of categories)	81.03 %	83.09 %	π=83.33 %	π=90.84 %

Study II:

Observer agreement and stability for 17 FIA-Categories.

Modified Scott-Coefficient for units and percentage agreement for sequences of chains of categories.

	Observer agreement	Observer stability	
		Observer 1	Observer 2
Scott Coefficient for 17 FIA-Categories (frequencies)	π = 0.85	π = 0.90	π = 0.84
Percentage agreement for 17 FIA-Categories (sequence by sequence)	83 %	95 %	80 %

The first 14 minutes (study I) and the first 10 minutes (study II) of each pre- and post-test were coded taking into account Flanders' ground rules for coding (1). Each lesson is represented by approximately 280 or 200 observations, respectively.

To determine the efficacy of the course the Wilcoxon-test (for the comparison of pre- and post-tests, post-tests and retention tests, or pre-tests and retention tests) and the U-test (for the comparison of differences of pre-/post-tests of the treatment group with the differences of the control group) were used.

(1) See Amidon/Flanders 1963, 1967; Flanders 1970; FWLERD 1972

Results

Results Related to the Course Objectives

(Variables 1 and 2, Hypothesis Group A) (1)

Preliminary remarks concerning the behavioral data assessed by the modified FIAC"system"

In assessing the behavioral data, it is to be distinguished between "units" and "chains":

"Unit" refers to the single categories of the FIAC system as recorded approximately every three seconds or at each change in category.

"Chains" are defined as an uninterrupted sequence of units of the same category.

for examples, 41 41 41 refers to a chain of category 41, consequently a knowledge question (study I) or a lower cognitive question of about 9 seconds (study II).

A chain is discontinued through a shift to another category,

for example 41 41 41 44.

The following tables contain the variables concerning the course objectives, higher cognitive questions and probing questions; they show the portion of higher cognitive questions of all questions, calculated as:

Study I

$$\text{Var.1: } \frac{\text{Sum of chains of cat. } 44 + 45 + 46}{\text{Sum of chains of cat. } 41 + 42 + 43 + 44 + 45 + 46} \cdot 100$$

Study II

$$\text{Var.1: } \frac{\text{Sum of chains of cat. } 44}{\text{Sum of chains of cat. } 41 + 44} \cdot 100$$

as well as the percentual portion of probing questions of the entire interaction, calculated as:

Study I + II

$$\text{Var.2: } \frac{\text{Sum of units of cat. } 31}{\text{Sum of all units}} \cdot 100$$

---

(1) For the following, see the hypotheses and questions of this study (p. 16), the definitions of the six cognitive levels (App.1) and the 27 or 17 categories, respectively (p.36 resp. p.37).

All tables refering to the single hypotheses are written in gothic letters, *all tables refering to variables are written in italic letters.*

For the pre-test/post-test-comparison, n = 29.
For the two retention test comparisons, n = 14.
Comparison group, n = 16.

The comparisons of the pre-test with post-test, post-test with retention-test, and pre-test with retention-test are tested for significance with the U-test. The comparison of the increases in the experimental group and in the comparison group are tested with the U-test.

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
1	Portion of HIGHER COGNITIVE QUESTIONS of all cognitive questions (in percent)	pre	29	27.86	62.21	xxx	16	20.30	13.62	xxx	xxx
		post	29	80.07			16	33.92			
		RETENTION TEST									
		post	14	64.03	-16.25	x		———			———
		ret.	14	67.78							
		pre	14	27.84	39.94	xxx		———			
		ret.	14	67.78							
2	Portion of PROBING QUESTIONS of the total time of interaction (in percent of all coded units)	pre	29	1.62	1.64	xxx	16	1.04	0.36	-	x
		post	29	3.26			16	1.40			
		RETENTION TEST									
		post	14	2.81	0.43	-		———			———
		ret.	14	3.24							
		pre	14	1.74	1.50	xxx		———			
		ret.	14	3.24							
	Mean number of PROBING QUESTIONS	pre	29	4.28	3.69	xxx	16	2.94	0.56	—	xxx
		post	29	7.97			16	3.50			
		RETENTION TEST									
		post	14	7.36	0.07	-		———			———
		ret.	14	7.43							
		pre	14	4.64	2.79	xxx		———			
		ret.	14	7.43							

xxx: p≤0.01 xx: p≤0.02 x: p≤0.05 (one-tail)

a) As compared to the pre test, in the post test classroom discussions of teachers who have completed the course contain a significantly ($p \leq 0.01$) higher portion of higher cognitive questions of all questions (var. 1), and a significantly ($p \leq 0.01$) higher portion of probing questions of all coded units (var. 2). The difference in the increase from pre test to post test in the experimental and comparison group is likewise significant for both variables, even though, with probing questions, only on the 5 % level.

The mean number of probing questions is calculated for illustration. The results indicate the same trend.

b) An (unexpected) difference as compared to the post test occurs with those teachers who completed the course three months after the conclusion of the course in the variable "higher cognitive questions" where a smaller portion of higher cognitive questions occur in the retention test; the difference is nevertheless significant only on the 5 % level.

c) In the case of teachers who completed the course, the retention test is still significantly superior ($p \leq 0.01$) to the pre test in both variables.

At the same time, the proportion of cognitive questions of the entire interaction, calculated as

sum of the individual percentages of units of
cat. 41, 42, 43, 44, 45, 46 of the entire interaction

did not increase during the course of training. It actually (as also in the comparison group) decreased slightly. The data of the retention test approach the value of the pre test again; also the portion of classroom management questions of the entire interaction hardly changed:

		n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
Portion of COGNITIVE QUESTIONS of the total time of interaction (in percent of all coded units)	pre	29	13.19	-1.52	-	10	12.51	-1.09	-	-
	post	29	11.67			10	11.42			
	RETENTION TEST									
	post	14	11.31	2.50	xx					
	ret.	14	13.81							
	pre	14	14.12	-1.31	-					
	ret.	14	13.81							
Portion of CLASSROOM MANAGEMENT QUESTIONS of the total time of interaction (in percent of all coded units)	pre	29	6.77	0.53	-	10	6.84	0.20	-	-
	post	29	7.30			10	7.04			
	RETENTION TEST									
	post	14	8.29	-2.99	x					
	ret.	14	5.30							
	pre	14	7.58	-2.28	x					
	ret.	14	8.30							

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

Study II:

				n	Diff.	Sign.
1	Portion of HIGHER COGNITIVE QUESTIONS of all cognitive questions (in percent)	pre test	15.26	41	29.71	xxx
		post test	44.97			
2	Portion of PROBING QUESTIONS of the total time of interaction (in percent of all coded units)	pre test	1.64	41	-0.04	n.s.
		post test	1.60			

			n	*Diff.*	*Sign.*
Mean number of PROBING QUESTIONS	*pre-test*	2.85	*41*	*-0.22*	*n.s.*
	post-test	2.63			

xxx: p≤0.01 (one-tail)

a) As compared to the pre test, in the post test classroom discussions of secondary school teacher candidates who completed the course contain a significantly higher (p=0.01) portion of higher cognitive questions (var. 1). The portion of probing questions of the entire interaction remains approximately constant (var. 2).
The results for the mean number of probing questions reveal the same trend.

At the same time, the proportion of cognitive questions of the entire interaction calculated as

sums of the individual percentages of cat. 41 + 44 in the entire interaction

as well as the portion of classroom management questions of the entire interaction, remained approximately constant (1):

		n		Diff.	Sign.
Portion of COGNITIVE QUESTIONS of the entire interaction (in percent of all categorized units)	*pre-test*	*41*	*15.96*	*0.84*	*n.s.*
	post-test		*16.82*		
Portion of CLASSROOM MANAGEMENT QUESTIONS of the entire interaction (in percent of all categorized units)	*pre-test*	*41*	*2.74*	*0.18*	*n.s.*
	post-test		*2.92*		

p≤0.01 (two-tail)

d.) In addition to the changes of behavior in the participants and their pupils recorded by direct observation in the pre-test and post-test, and in addition to accompanying informal observations and a conclusive meeting, a questionnaire with 59 items was filled out by those participants who completed the course.

The tables in appendix 2 show the results of the participants' evaluations for both studies in detail.

The reactions of the participants for both studies were positive for most of the questions; this applies to the course in general, in its comparison with other programs, to the material the course is based upon, and to the contents of MK 9. It applies especially to the teaching

(1) Also here, explanatory remarks and variables are written in italic.

skills offered in the course for training, to the approach of concentrating on single skills during training, and to the Microteaching methods in general. It is also true for self-confrontation via tape or television recording, as well as for the evaluation of the effects of changes in their own behavior on that of the pupils.

Diverse evaluations between the two groups of teachers (study I and study II) result particularly from differences in training conditions and organizational form of the two courses. The differences occur with the participants' evaluation of the amount, significance and implementability of the theoretical background knowledge presented in MK 9 or the seminar; they also refer to their estimation of their own progress achieved during small group teaching.

Unlike the majority of student teacher candidates (62 %), only 12 % of the teachers of study I believe that the behavioral changes aimed at by MK 9 will have a positive effect upon their supervisor's evaluation. Here the different phases of training are to be considered; teachers candidates, as opposed to inservice teachers, are still under examination pressure.

As mentioned, the inservice teachers of study I could work through the course as scheduled, individually and in a self-organized manner. With the teaching candidates, though, all activities relating to the handbook had to be divided into weekly, two-hour meetings, which were lead by the seminar organizer. Therefore it is not surprising that a much smaller range remained for the teaching candidates, within which they could independently work. Accordingly, only 49 % of the participants positively answered the question of whether the course incited them to independent work (as distinguished from the participants of study I, where it was 86 %). Perhaps differences in the organization are the reason why only 31 % of the teaching candidates (study I: 55 %) answered negatively to the question of whether they considered this type of course to be just an adaptation to the existing social system.

While 76 % and 81 % respectively of the inservice teachers felt that the course contained a lot of theoretical background knowledge, and that the theoretical statements were significant, only 33 % and 44 %

of the teaching candidates expressed this opinion. Considering, as compared to the study I teachers, the differences in education and especially the little practical experiences of the secondary teacher candidates (who had attended university only a few months earlier), they may have been not so much used to be confronted with results derived essentially from "applied research", and which are therefore less abstract. 74 % of the inservice teachers, but only 47 % of the teaching candidates, think that the background knowledge of the course could successfully be implemented in the concrete classroom situation. The possibilities for practical exercises with the teaching candidates (possibilities which, unlike study I, were much slighter, and burdened with organizational difficulties) may stand behind this judgement, particularly because the participants wanted more, and more intensive, training possibilities. An indicator for this may also be that only 34 % of them believe to have learned something new in the small group lessons (79 % in study I), and that their course gain was smaller than that of study I.

However, the results of the first question of the studies altogether show that training courses which contain these elements

- concrete description of the behavior (Technical Skills Approach),
- model learning and discrimination training,
- sufficient possibilities for Microteaching exercises without organizational difficulties, and
- feedback via television and tape recordings with self-evaluation

are able to change teacher behavior, and are also judged positively by the trainees, despite some difficulties. This result confirms other Microteaching studies, especially evaluations for MC 9 in the U.S.A

are able to change teacher behavior, and are also judged positively by the trainees, despite some difficulties. This result confirms other Microteaching studies, especially evaluations for MC 9 in the U.S.A. and in the Netherlands (see above).

The results of the questionnaire also show where, among other things, the revision of the German test version of MK 9 has to concentrate on. If films are to be used for the courses (this seems unnecessary in certain circumstances (see below)), then their quality must be substantially improved. Also, the possibility for self-evaluation through direct observation needs to be extended and specified, thereby seeking to explain its importance as a focus for training.

Additional Changes in Teacher Behavior (variables 3 and 4)
Hypothesis Group B

Apart from the direct teacher objectives, additional changes in teacher behavior are assessed by two FIAC-ratios which are a measure for the indirect/direct teacher influence .

The Indirect/Direct Ratio (IDR) is calculated as (1)

Study I + II

$$\frac{\text{Sum of units of cat. } 1 + 2 + 3 + 4}{\text{Sum of units of cat. } 1 + 2 + 3 + 4 + 5 + 6 + 7}$$

the Teacher Response Ratio (TRR) as

$$\frac{\text{Sum of units of cat. } 1 + 2 + 3}{\text{Sum of units of cat. } 1 + 2 + 3 + 6 + 7}$$

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
3	IDR	pre	29	0.74	0.12	xxx	16	0.72	0.0	-	x
		post	29	0.86			16	0.72			
		RETENTION TEST									
		post	14	0.80	0.01	-					
		ret.	14	0.87							
		pre	14	0.76	0.11	xxx					
		ret.	14	0.87							
4	TRR	pre	29	0.85	0.08	xxx	16	0.88	0.0	-	xx
		post	29	0.93			16	0.88			
		RETENTION TEST									
		post	14	0.91	0.04	-					
		ret.	14	0.95							
		pre	14	0.84	0.11	xxx					
		ret.	14	0.95							

xxx: p≤0.01 xx: p≤0.02 x: p≤0.05
(two-tail)

(1) The FIAC-ratios are calculated from the 10 basic categories of the FIAC system. Flanders 1970.

Study I

a) Teachers who completed the course use significantly more behaviors of indirect influence (IDR, TRR) during classroom discussion than before the course (the difference from the one in the comparison group is significant in both variables ($p \leq 0.05$ or 0.02, respectively).

b) Three months after completion of the course, those teachers who completed the course show no significant difference in the frequency of behavior of indirect influence during classroom discussion when compared to the post-test.

c) Three months after completion of the course, those teachers who completed the course use significantly more ($p \leq 0.01$) behaviors of indirect influence during classroom discussion, as compared to the pre-test.

With this, the expectations regarding additional changes caused by MK 9-training are fulfilled.

Study II:

				n	Diff.	Sign.
3	IDR	pre test	0.63	41	0.03	n.s.
		post test	0.66			
4	TRR	pre test	0.94	41	0.00	n.s.
		post test	0.94			

xxx: $p \leq 0.01$ (two-tail)

The teaching candidates who completed the course use almost the same amount of behaviors of indirect influence (IDR, TRR) during classroom discussion as before the course.

Changes in Directly Observable Student Behavior

Variables 5 - 14, Hypothesis Group C

The changes in directly observable behavior are assessed in two groups of variables. One deals with student behavior in general (Var. 5 - 10), and the other with student behavior that can be considered when associated with the preceding teacher question, as an index for the quality, and thus appropriateness for the situation or adressee (var. 11 - 14).

It is to be emphasized that the variables used for the evaluation and defined on the basis of the FIAC-system are not independent from each other. Consequently, they can by no means be looked at separately, but are interpretable only as a complete system.

Variables 5 + 6: Student Talk (1)

Student talk is assessed with the FIAC-ratio PTR (Pupil Talk Ratio), calculated as

Study I + II

$$\text{Var.5: PTR: } \frac{\text{Sum of units of cat. } 8 + 9}{\text{Sum of units of cat. } 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10}$$

and as the number of cognitive student utterances

Study I: Var.6: Sum of chains of cat. 81 + 82 + 83 + 94 + 95 + 96

Study II: Var.6: Sum of chains of cat. 81 + 94

(1) Generally, when the student utterances are assessed, only those utterances are included which are relevant for the hypotheses of this study, i.e. those responses that can be classified according to Bloom's taxonomy.

However, the FIAC-ratios are based upon the 10 basic categories of the FIAC-system, and thus assess all student utterances, including student questions (cat. 80, 87, 90, 97). This hardly alters the results, since these categories occur extremely seldom.

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
5	PTR	pre	29	0.44	0.06	x	16	0.46	0.01	-	-
		post	29	0.50			16	0.45			
		RETENTION TEST									
		post	14	0.53	0.02	-		———			———
		ret.	14	0.55							
		pre	14	0.44	0.11	xx		———			
		ret.	14	0.55							
6	Mean number of cognitive student utterances	pre	29	56.72	-0.34	-	16	60.00	-8.19	-	-
		post	29	58.38			16	51.81			
		RETENTION TEST									
		post	14	58.71	-3.28	-		———			———
		ret.	14	55.43							
		pre	14	58.57	-3.14	-		———			
		ret.	14	55.43							

xxx: p≤0.01 xx: p≤0.02 x: p≤0.05
(two-tail)

The following results regarding student talk were obtained:

a) The portion of student talk of the entire interaction increases from pre- to post-test ($p \leq 0.05$), as expected. As compared with the comparison group, the difference is not significant, though.

b) No significant difference exists in these variables from the post-test to the retention-test, and

c) the retention-test still shows significantly better results than the pre-test ($p \leq 0.02$).

On the other hand, in the case of those teachers who completed the course, a slight-insignificant-decrease in the mean number of cognitive student utterances appears in all comparisons:

a) from pre-test to post-test (the difference is not significant when compared to that of the comparison group)

b) from post-test to retention-test, and from

c) pre-test to retention-test.

Study II:

				n	Diff.	Sign.
5	PTR	pre test	0.30	41	0.05	x
		post test	0.35			
6	Mean number of cognitive student utterances	pre test	27.95	41	0.34	n.s.
		post test	28.29			

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

The portion of student talk of the entire interaction (PTR) increases slightly, yet significantly ($p \leq 0.05$). The number of cognitive student utterances remains approximately constant.

Since some authors found or presumed a negative correlation between the quantity or type of teacher questions and the one of student questions (Tausch/Tausch 1970), others a positive (K.E. Claus 1969), also student questions have been included in the evaluation:

Study I:

		n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
Portion of reactive STUDENT QUESTIONS of the entire interaction (in percent of all coded units)	pre	29	0.22	-0.20	x	16	0.11	0.02	-	-
	post	29	0.03			16	0.13			
	RETENTION TEST									
	post	14	0.03	-0.03	-	———				———
	ret.	14	0.00							
	pre	14	0.16	-0.16	-	———				
	ret.	14	0.00							
Portion of initiative STUDENT QUESTIONS of the entire interaction (in percent of all coded units)	pre	29	0.06	0.20	-	16	0.02	0.18	-	-
	post	29	0.26			16	0.20			
	RETENTION TEST									
	post	14	0.28	0.17	-	———				———
	ret.	14	0.42							
	pre	14	0.03	0.39	-	———				
	ret.	14	0.42							
Mean number of STUDENT QUESTIONS	pre	29	0.48	-0.07	-	16	0.25	0.19	-	-
	post	29	0.41			16	0.44			
	RETENTION TEST									
	post	14	0.50	-0.14	-	———				———
	ret.	14	0.36							
	pre	14	0.29	0.07	xxx	———				
	ret.	14	0.36							

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

The results indicate that student questions occur very seldom.

Study II:

Also in this study student questions have been included in the evaluation.

			n	Diff.	Sign.
Portion of reactive STUDENT QUESTIONS at the entire interaction (in percent of all coded units)	*pre-test*	*0.16*	*41*	*-0.09*	*n.s.*
	post-test	*0.07*			
Portion of initiative STUDENT QUESTIONS of the entire interaction (in percent of all coded units)	*pre-test*	*0.32*	*41*	*0.24*	*n.s.*
	post-test	*0.56*			
Mean number of STUDENT QUESTIONS	*pre-test*	*0.68*	*41*	*0.30*	*n.s.*
	post-test	*0.98*			

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$

(two-tail)

In this study, student questions occur very seldom, too.

Variables 7 and 8: Length of Student Utterances

The length of the sutdent responses is assessed as the individual percentage of student responses of 3 (3-seconds) units and more of all student utterances:

Study I

$$\text{Var. 7:} \quad \frac{\text{Sum of chains of cat. 81 + 82 + 83 + 94 + 95 + 96 that are 3 units longer or more}}{\text{Sum of chains of cat. 81 + 82 + 83 + 94 + 95 + 96}} \cdot 100$$

Study II

$$\text{Var. 7:} \quad \frac{\text{Sum of chains of cat. 81 + 94 that are 3 units long or more}}{\text{Sum of chains of cat. 81 + 94}} \cdot 100$$

and as FIAC-ratio PSSR (Pupil Steady State Ratio):

Study I and II:

$$\text{Var. 8: PSSR:} \quad \frac{\text{Sum of 8-8 + 9-9 cells}}{\text{Sum of units of cat. 8 + 9}}$$

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
7	Percentage of student utterances which are 3 (3-seconds) units long or more	pre	29	26	11	xxx	16	27	7	-	-
		post	29	37			16	34			
		RETENTION TEST									
		post	14	42	6	-					
		ret.	14	48							
		pre	14	27	21	xxx					
		ret.	14	48							
8	PSSR	pre	29	0.54	0.06	xx	16	0.58	0.03	-	-
		post	29	0.60			16	0.61			
		RETENTION TEST									
		post	14	0.62	0.06	-					
		ret.	14	0.68							
		pre	14	0.53	0.15	xxx					
		ret.	14	0.68							

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

With the teachers and with the students of the teachers who completed the course, in both variables there is a significant change in the expected direction:

a) In the post-test, there is a significantly higher ($p \leq 0.01$) percentage of student utterances which are 3 units long or more. Also the Pupil Initiation Ratio (PSSR) increased significantly ($p \leq 0.02$) (both differences were not significant as compared to those of the comparison group, because in this group a non-significant increase from the pre- to post-test occured in both variables.

b) This change remained stable over the three months period following the end of the course in both variables. No significant difference exists between the post-test and retention-test.

c) In both variables, the retention-test is significantly ($p \leq 0.01$) superior to the pre-test.

Study II:

				n	Diff.	Sign.
7	Percentage of student utterances which are 3 units (3-seconds) long or more	pre-test	0.22	41	0.08	xxx
		post-test	0.30			
8	PSSR	pre-test	0.46	41	0.12	xxx
		post-test	0.54			

xxx: $p \leq 0.01$ (two-tail)

There is an expected change in student behavior in both variables. In the post-test, there is a significantly ($p \leq 0.01$) higher percentage of student utterances of 3 units or more; likewise, the Pupil Steady State Ratio (PSSR) increased significantly ($p \leq 0.01$).

Variable 9 + 10: Student Utterances on a Higher Cognitive Level, or Initiative Student Utterances

Student utterances on a higher cognitive level are assessed as percentage of student utterances which are on a higher cognitive level:

Study I:

$$\text{Var.9: } \frac{\text{Sum of chains of cat. } 94 + 95 + 96}{\text{Sum of chains of cat. } 81 + 82 + 83 + 94 + 95 + 96} \cdot 100$$

Study II:

$$\text{Var.9: } \frac{\text{Sum of chains of cat. } 94}{\text{Sum of chains of cat. } 81 + 94} \cdot 100$$

Initiative student utterances are assessed in the FIAC-Ratio PIR (Pupil Initiation Ratio), that is, including all subcategories of category 8 and 9.

Study I + II:

$$\text{Var.10 PIR: } \frac{\text{Sum of units of cat. } 9}{\text{Sum of units of cat. } 8 + 9} \cdot 100$$

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
9	Percentage of STUDENT UTTERANCES which are on a HIGHER COGNITIVE LEVEL	pre	29	24	58	xxx	16	21	6	x	xxx
		post	29	62			16	27			
		RETENTION TEST									
		post	14	83	-10	-					
		ret.	14	73							
		pre	14	23	50	xxx					
		ret.	14	73							
10	PIR	pre	29	0.23	0.61	xxx	16	0.21	0.07	x	xxx
		post	29	0.84			16	0.28			
		RETENTION TEST									
		post	14	0.84	-0.07	-					
		ret.	14	0.77							
		pre	14	0.22	0.55	xxx					
		ret.	14	0.77							

xxx: p≤0.01 xx: p≤0.02 x: p≤0.05 (two-tail)

The result here also point in the expected direction (a difference between the results of both variables scarcely exists): the cognitive level of the student utterances rose because of their teachers' work with the course.

a) With students of those teachers who completed the course, there is a significantly higher portion ($p \leq 0.01$) of their utterances on a higher cognitive level, as compared to the pre-test (they also have a significantly higher ($p \leq 0.01$) Pupil Initiation Ratio). This increase is significant compared to that of the comparison group in both variables, although the comparison group also shows an increase ($p \leq 0.05$) from the pre- to post-test.

b) No significant difference exists in both variables between the post-test and retention-test, and

c) a significant ($p \leq 0.01$) difference exists between the retention-test and pre-test.

Study II:

				n	Diff.	Sign.
9	Percentage of STUDENT UTTERANCES which are on a HIGHER COGNITIVE LEVEL	pre test	18	41	28	xxx
		post test	46			
10	PIR	pre test	0.22	41	0.32	xxx
		post test	0.54			

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

Student behavior changes from the pre- to post-test in both variables, as expected. The percentage of student responses on a higher cognitive level, as well as the percentage of initiative student utterances, increased significantly ($p \leq 0.01$).

The attempt was made with the following variables (Var. 11 - 14) to associate the interaction sequences initiated by a question with that question, according to their cognitive level and their frequency. This was undertaken to move beyond the simple assessment of frequencies of teacher questions and student utterances on different cognitive levels, and to get information on the type and cognitive level of the question-answer-interaction, i.e. the quality of this interaction. It is not evident from the classification of the FIAC-system which student utterances relate to the preceding question and which do not, and thus, to what extent the question stimulates the following cognitive processes in the student (as evident in the following interaction sequence). For this reason, student responses have been associated with the preceding teacher question within differently defined interaction sequences.

Definition 1: All student utterances which follow a teacher question are considered as belonging to an interaction sequence as initiated by this question; the sequence is terminated by any teacher utterance, except for:
- acceptance of student feelings
- praise
- simple acknowledgement of student ideas (1)
- classroom management lessons,
- information, if only one unit long
- giving directions, if only one unit long; it is also not terminated by
- silence/confusion.

Definition 2: All student utterances which follow a teacher question are considered as belonging to an interaction sequence as initiated by this question; the sequence is terminated by any teacher category (cat. 1 to 7 including subcategories), except for:
- classroom management questions (calling on students etc./ unclassifiable questions); it is also not terminated by
- silence/confusion.

---

(1) As opposed to use of student ideas.

Variable 11: Student Utterances on the Same Cognitive Level as the Preceding Teacher Question

This variable refers to the agreement of every single student utterance, on one of the six cognitive levels determined by Bloom, with the preceding teacher question, again on one of the six cognitive levels. The variable is calculated as the percentage of student utterances which are on the same cognitive level as the preceding question.

Study I

$$\text{Var.11:} \quad \frac{\text{Sum of chains of cat. 94 following cat. 44, cat. 95 following cat.45, cat. 96 following cat. 46, cat. 81 following cat.41, cat. 82 following cat. 42, cat. 83 following cat.43}}{\text{Sum of chains of cat. 81 + 82 + 83 + 94 + 95 + 96}} \cdot 100$$

Study II

$$\text{Var.11:} \quad \frac{\text{Sum of chains of cat. 81 following cat. 41, " " " 94 following cat. 44}}{\text{Sum of chains of cat. 81 + 94}} \cdot 100$$

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
11	Portion of student utterances ON THE SAME COGNITIVE LEVEL AS THE PRECEDING QUESTION (in percent of all cognitive student utterances) Def. 1	pre	29	79.50	9.3	xxx	16	77.20	-3.1	-	-
		post	29	88.80			16	74.10			
		RETENTION TEST									
		post	14	85.20	7.0	-					
		ret.	14	92.20							
		pre	14	78.90	13.3	xxx					
		ret.	14	92.20							
11	Def. 2	pre	29	93.70	9.8	xxx	16	83.60	-3.4	-	xx
		post	29	93.50			16	80.40			
		RETENTION TEST									
		post	14	90.40	4.5	-					
		ret.	14	94.90							
		pre	14	84.2	10.7	xxx					
		ret.	14	94.9							

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

a) Students of teachers who completed the course perform a significantly higher ($p \leq 0.01$) percentage of utterances on the same cognitive level as the preceding question, as compared to before the course. This change is significantly different from the one in the comparison group in the results of definition 2.

Definition 1 includes longer interaction sequences and definition 2 shorter ones. A teacher question, which determines the cognitive level of the following interaction (regardless of whether the teacher participated in a training of higher cognitive questions), is presumable not always able to determine the cognitive level of those answers which follow long intervals, and are perhaps influenced by intermediary teacher utterances. In the case of definition 2, which only includes utterances which directly follow the teacher question, the percentage of student utterances on the same cognitive level as the question is higher. This may explain why the difference in the pre/post differences between the experimental and the comparison group is not significant for definition 1 (although the significance level of $p \leq 0.05$ is almost reached), while it is significant for definition 2.

b) No significant difference occurs between the post-test and the retention-test, and

c) the difference between the pre-test and retention-test is significant ($p \leq 0.01$).

Study II:

				n	Diff.	Sign.
11	Portion of student utterances ON THE SAME COGNITIVE LEVEL AS THE PRECEDING QUESTION (in percent of all cognitive student utterances) Def. 1	pre-test	90.5	41	-0.10	n.s.
		post-test	89.5			
11	Def. 2	pre-test	93.2	41	0.8	n.s.
		post-test	94.0			

xxx: $p \leq 0.01$ (two-tail)

The proportion of student responses on the same cognitive level as the preceding question remained approximately constant from pre-test to post-test, according to both definitions. With the rough classification of teacher questions and student utterances according to only two cognitive levels in study II, possible changes in the correspondance of teacher questions and student utterances cannot be detected.

Variable 12: Student Utterances Following Higher Cognitive Questions

This variable is calculated as

Study I

Var.12: Sum of chains of cat. 81 + 82 + 83 + 94 + 95 + 96, following cat. 44 + 45 + 46

Study II

Var.12: Sum of chains of cat. 81 + 94 following cat. 44

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
12	Mean number of student utterances following HIGHER COGNITIVE QUESTIONS Def. 1	pre	29	14.72	28.66	xxx	16	12.06	-0.50	-	xxx
		post	29	43.38			16	11.56			
		RETENTION TEST									
		post	14	45.79	-9.86	-					
		ret.	14	35.93							
		pre	14	15.43	20.50	xxx					
		ret.	14	35.93							
12	Def. 2	pre	29	7.14	11.31	xxx	16	5.57	1.88	-	xxx
		post	29	18.45			16	7.63			
		RETENTION TEST									
		post	14	19.43	1.21	-					
		ret.	14	20.64							
		pre	14	7.86	12.78	xxx					
		ret.	14	20.64							

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

a) The number of student utterances following higher cognitive questions increased significantly ($p \leq 0.01$) with students of those teachers who completed the course, as compared to the number of responses before the teachers undertook the course.

b) No significant difference exists between the post- and the retention-test.

c) A significant ($p \leq 0.01$) difference exists between the pre-test and the retention-test.

There is no difference in the results of the significance tests for the results from both definitions.

Study II:

				n	Diff.	Sign.
12	Mean number of student utterances following HIGHER COGNITIVE QUESTIONS Def. 1	pre-test	4.51	41	6.15	xxx
		post-test	10.66			
12	Def. 2	pre-test	1.88	41	3.68	xxx
		post-test	5.56			

xxx: $p \leq 0.01$ (two-tail)

The number of higher cognitive student utterances increased significantly ($p \leq 0.01$) from the pre-test to the post-test (according to both definitions).

As a supplement, the results of variable 12 should be imparted as explanation, associating the number of student utterances with the preceding teacher question, standardized with the number of higher cognitive questions asked during the respective classroom discussion. These data are based on definition 1. Results of this calculation for variable 12:

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
12	Mean number of student utterances following each single HIGHER COGNITIVE QUESTION	pre	29	2.01	0.79	xxx	16	1.68	0.14	-	-
		post	29	2.80			16	1.82			
		RETENTION TEST									
		post	14	2.65	-0.69	-					
		ret.	14	1.96							
		pre	14	1.69	0.27	-					
		ret.	14	1.96							

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

The table shows that the mean number of student utterances following each single question increases significantly ($p \leq 0.01$) from pre-test to post-test; this increase is not significant as compared to the one in the comparison group, and cannot be observed in the retention test any more.

Study II:

				n	Diff.	Sign.
12	Mean number of student utterances following each single HIGHER COGNITIVE QUESTION	pre-test	1.73	41	0.47	x
		post-test	2.20			

xxx: $p \leq 0.01$ xx: $p \leq 0.02$ x: $p \leq 0.05$ (two-tail)

The mean number of student utterances following each single higher cognitive question increased significantly ($p \leq 0.05$) from pre-test to the post-test.

Variable 13: Length of Student Utterances Following Higher Cognitive Questions

This variable is assessed as the mean length of student utterances in three second units, following higher cognitive questions.

Study I

Var.13: $\frac{\text{Sum of units of cat. 81+82+83+94+95+96 following cat.44+45+46}}{\text{Sum of chains of cat. 81+82+83+94+95+96 following cat.44+45+46}}$

Study II

Var.13: $\frac{\text{Sum of units of cat. 81+94 following cat. 44}}{\text{Sum of chains of cat.81+94 following cat. 44}}$

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
13	Mean length of student utterances following HIGHER COGNITIVE QUESTIONS (in 3-sec.units) Def. 1	pre	29	1.95	0.52	xxx	16	2.22	0.37	-	-
		post	29	2.47			16	2.59			
		RETENTION TEST									
		post	14	2.56	0.32	-		——			
		ret.	14	2.90							
		pre	14	1.92	0.98	xxx		——			
		ret.	14	2.90							
13	Def. 2	pre	29	1.99	0.49	xxx	16	2.34	0.16	-	-
		post	29	2.48			16	2.50			
		RETENTION TEST									
		post	14	2.54	0.41	-		——			
		ret.	14	2.95							
		pre	14	1.98	0.97	xx		——			
		ret.	14	2.95							

xxx: p≤0.01 xx: p≤0.02 x: p≤0.05(two-tail)

a) As compared to their pre-course behavior, students of teachers who have completed the course, delivered significantly longer (p≤0.01) utterances following higher cognitive questions, in classroom discussions.

b) No significant difference exists from post-test to retention-test, and

c) the difference from pre-test to retention-test is significant (p≤0.01 or 0.02, respectively).

The results of the two sequence definitions generated essentially comparable results.

Study II:

				n	Diff.	Sign.
13	Mean length of student utterances following HIGHER COGNITIVE QUESTIONS Def.1	pre-test	2.21	41	0.92	xxx
		post-test	3.13			
13	Def.2	pre-test	2.09	41	1.21	xxx
		post-test	3.30			

xxx: $p \leq 0.01$ (two-tail)

The student utterances following higher cognitive questions are significantly ($p \leq 0.01$) longer after the course, as compared to before the course.

Variable 14: Higher Cognitive Student Utterances following Higher Cognitive Questions

This variable is calculated as

Study I

Var.14: Sum of chains of cat. 94 + 95 + 96 following cat. 44 + 45 + 46

Study II

Var.14: Sum of chains of cat. 94 following cat. 44

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
14	Mean number of HIGHER COGNITIVE student utterances following HIGHER COGNITIVE QUESTIONS Def. 1	pre	29	10.93	30.97	xxx	16	9.00	-0.44	-	xxx
		post	29	41.90			16	8.56			
		RETENTION TEST									
		post	14	43.85	-9.35	-		———			
		ret.	14	34.50							
		pre	14	11.07	23.43	xxx		———			
		ret.	14	34.50							
14	Def. 2	pre	29	5.66	12.24	xxx	16	4.81	0.87	-	xxx
		post	29	17.90			16	5.68			
		RETENTION TEST									
		post	14	18.57	1.36	-		———			
		ret.	14	19.93							
		pre	14	5.79	14.14	xxx		———			
		ret.	14	19.93							

xxx: p≤0.01 xx: p≤0.02 x: p≤0.05 (two-tail)

a) With students of teachers who have completed the course, there are significantly more (p≤0.01) higher cognitive utterances following higher cognitive questions than before the course.

b) No significant difference exists from the post-test to the retention-test.

c) A significant (p≤0.01) difference exists between the pre-test and retention-test.

No difference appears in the results of the significance tests in both sequence definitions.

Study II:

				n	Diff.	Sign.
14	Mean number of HIGHER COGNITIVE student utterances following HIGHER COGNITIVE QUESTIONS Def. 1	pre test	3.76	41	6.61	xxx
		post test	10.37			
14	Def. 2	pre test	1.61	41	4.34	xxx
		post test	5.95			

xxx: $p \leq 0.01$ (two-tail)

With students of teachers who have completed the course, there are significantly more ($p \leq 0.01$) higher cognitive utterances following higher cognitive questions than before the course.

The standardization of the number of higher cognitive student utterances with the number of higher cognitive questions reveals comparable results for both studies:

Study I:

			n	Treatm. group	Diff.	Sign.	n	Comp. group	Diff.	Sign.	Sign. of Diff.
16	Mean number of HIGHER COGNITIVE student utterances following each single HIGHER COGNITIVE QUESTION	pre	29	1.92	0.99	xxx	16	1.61	-0.13	-	xxx
		post	29	2.91			16	1.48			
		RETENTION TEST									
		post	14	3.05	-0.85	-					
		ret.	14	2.20							
		pre	14	1.91	0.29	-					
		ret.	14	2.20							

xxx: $p \leq 0.01$ (two-tail)

Study II:

				n	Diff.	Sign.
14	Mean number of HIGHER COGNITIVE student utterances following each single HIGHER COGNITIVE QUESTION	pre-test	1.31	41	0.53	xxx
		post-test	1.84			

xxx: $p \leq 0.01$ (two-tail)

During study I the attempt was made to obtain information concerning the implementation, contents, and organization of the course as well as information concerning the motivation, work-plan and working intensity of the participants. This attempt was undertaken through careful observations during the course, and through a great many discussions (including individual discussions) with all persons involved, that is with participants and with the staff. In study II the organizer of the MK 9-seminar was interviewed on these topics. Additionally, at each test site (in connection with the filling out of the final questionnaires by the participants) both courses ended with a two to three hour general discussion, where the participants introduced their experiences and criticisms.

These observations and criticisms extensively confirm the results as could be obtained from the behavioral data and questionnaires.

- In general, during the course and in the concluding discussions, the feeling prevailed among the participants that they had gained something during the course. They felt that the course was a good tool for working on their own behavior concretely and effectively.
- In study I it was especially the way the work could be organized during the training which got the approval of the participants; being done without supervision the work could be free from hierarchies. Also the possibility of co-operation with colleagues within the school was a characteristic of the course that was stressed by the participants.
- Likewise, in study I, the motivation and relaxation involved, if training takes place as a scaled-down teacher encounter, frequently came up in indidvidual discussions as well as in the final discussion. In both courses the Microteaching method, confirmed by the evaluations from the questionnaires and from discussions with the seminar staff, was extensively accepted.
- On the negative side, the main critical point was the additional work load . The participants of study I carried out the course besides their normal teaching duties. The majority felt it very tiring to work through a 200 page exercise book, and to carry out the numerous practical exercises and evaluate them. This was raised

repeatedly, especially since the course topic "teacher questions" touches only a small aspect of the many-sided spectrum of school requirements.

- The considerable organizational problems for the participants during the course, especially in the case of the teaching candidates of study II, are to be added. Such problems lay especially in the provision of rooms for the training; they also lay in the time needed for the experiments, which were often carried out with great difficulties before and after the lesson, during leisure hours, in the seminar, etc.

As in the original version, the main objectives in the German version of Minicourse 9 are to increase the teacher's use of higher cognitive questions and probing questioning in classroom discussions.

The data of study I (elementary school teachers, inservice) indicate that the course indeed accomplished these objectives and that these changes persisted virtually undiminished in a follow-up test about 3 months later. Furthermore, significant changes in direct teaching behavior resulted from the training, and these changes were permanent in the follow-up test. This may indicate that, having completed the MK 9-training, teachers no longer restricted and dominated classroom discussions, and that the students were generally more interested and more willing to participate.

With secondary school teacher candidates in study II, only the percentage of higher cognitive questions increased, while the amount of probing questions and other indirect teacher behaviors (TRR, IDR) remained relatively constant.

This result may be the consequence of the conditions under which the training with MK 9 took place; it had to adjust to the conventional seminar structure of weekly meetings, and above all, to the much smaller number of practical Microteaching exercises.

The trainees of both studies also reacted favorably to the course.

As a consequence of the training based on MK 9, student behavior changed considerably: the percentage of pupil talk and pupil initiation, and the length and frequency of higher cognitive utterances (but not the frequency of all student utterances) increased in both studies. Besides the increase in higher cognitive questions, this percentage increase may result from the improved quality and appropriateness of these questions; the significant increases in the percentage of student utterances on the same cognitive level as the preceding questions, and the frequency and length of student utterances to higher cognitive questions indicate this.

A further result from study I indicates quite clearly that the written version of MK 9 is at least equally as effective as the video version.

The results from both studies are consistent with the results from other studies, whether they be from the FWLERD or from other countries. Although the data indicate that a revision of the course is necessary, especially in view of the teacher training system in West Germany, it can be summarized that, apart from the role and function of the OECD/CERI, the project "The International Transfer of Microteaching Materials" was successful.

Conclusions: The results of the two studies reported here consist of data from interaction analysis, from questionnaires, and from interviews during and after the course with teachers who participated in the course, and with personel responsible for the training at the co-operating seminars. These results are relatively positive for both studies; they suggest that further work with the material is worthwhile. In connection with the results and experiences of other studies (1), and with experiences made in the U.S.A. (2), they also suggest the direction any further development should take. The following negative reactions to Minicourse 9 (3) and its instructional model were often expressed, and are foremost to be taken into consideration:

1. lack of theoretical discussion of the course contents, and of the method used during the training;
2. the definition of teaching skills too isolated from the situational context they are applied in. Also the frequent undifferentiated boosting of teacher skills in a manner difficult to justify in view of actual research standards.
3. adhering too rigidly to the precisely prescribed learning objectives during the course, and also rigidly setting the order and form of training and evaluation procedures; only with regard to the duration and location of the training were changes possible. This rigidity, then, hardly renders possible training to fulfil the individual intentions, interests and needs of trainees;
4. the problem of the participants as well as of the teacher training institutions to commit themselves for a comparatively long period of time to a course covering only quite a small segment of pre- and inservice requirements;
5. the high cost of the material that render difficult or impossible any revisions after the course is implemented. In addition, they have the effect that the material is difficult to implement in differing teacher training situations and to adjust to the respective actual research standards.

---

(1) cf. Klinzing / Klinzing-Eurich 1979.

(2) The authors were able to observe the use of Minicourses in American teacher education during several excursions.

(3) Compare, for example, Klinzing 1976, 1978.

The course under discussion was, and is, being fundamentally altered in order to meet these criticisms. The further work with this mate - rial (or rather with a material developed on the basis of it) as dealt with by the Center for New Learning Methods (1), essentially follows these guidelines:

1. The results of concurrent research on the single skills as well as on the course elements suggested for the acquisition of the skills, and their theoretical background are included in the material in a way that enables the participants, guided by the material, to define their own skills for the respective contexts and situations, and to select and organize an appropriate training procedure according to their own interests, objectives, and facilities.

2. This modification or addition becomes necessary since the material is to bring about self-initiated, self-guided, and effective experimentation with one's own behavior.

   It includes:

   a.) Selection of Training Objectives

   This begins with the possibility of individual selection of training objectives based on the analysis of individual behavior with simple evaluation instruments contained in the material.

   Suggestions concerning the format of situations, wherein one's own behavior can be observed and analyzed before the beginning of training, should be included in the material; shorter interaction situations with discussion partners or students are appropriate that are recorded and analyzed as "diagnostic teaches" by the trainee himself using T.V. or tape recordings. If necessary, the composition of one's own training program can be discussed with discussion partners and colleagues. Within the scope of the course contents, an offer and description of various skills in the handbook (in this case, of question types) in the context of related research, should allow the trainee to define his training objectives with respect to his own intentions and deficits, so that they are available for the training and the succeeding evaluations.

   b.) Determination of the Individual Learning Procedure by the Trainee

   The trainee chooses a learning procedure for every lesson, from those suggested in the course. He chooses the one which appears best-suited to, and most practical for his own goals; this choice is based upon the

---

(1) Meanwhile, a first test version which still needs revision has been developed by the authoress.

results of the "diagnostic lesson", and with the self-chosen training objectives in mind. This decision, open to constant revision throughout the course, includes: the arrangements for the working-through of the materials (whether one works alone, with a partner, or as a team in small groups); the kind and intensity of the learning activity (handbook lessons, discussion of course contents and individual objectives among colleagues or among the students or discussion partners of the exercises, and working out of written exercises); particularly the format of practical exercises (whether in dyadic situations or in small groups, with children or with colleagues, etc).

c.) Individual Choice and Composition of Procedures and Criteria for the Evaluation

After the conclusion of a lesson or of the entire training, the trainee chooses the respective evaluation criteria and methods suitable for him, using the handbook as a guide; with these he evaluates his success in achieving his learning objectives. This handbook attempts to provide an entire spectrum of evaluation criteria and procedures that are of varying range and complexity (lists of criteria, observation sheets, rating scales, open spaces for general impressions about what has occured etc.); many of them adapted from the related literature from the aspect of practicability and economic feasability, and in part, developed on our own. The trainee can also, however, develop his own procedures, which may correspond more closely to his own objectives.

d.) Assessment of One's Own Course Gain

It seems desirable that the teachers themselves assess their success of their work. The evaluation procedures, suggested for feedback in the practical exercises, can be compiled in a comprehensive system for the evaluation of the entire course. This evaluation is to be done as a comparison of the "self-evaluation lesson" being taught at the end of the course under the same conditions as the "diagnostic lesson" at the beginning, with this "diagnostic lesson". Thus, the trainee himself can evaluate his learning success in the course, and gain clues for possible further work with the same, or new, training objectives.

3. Material in such a form also allows the trainee to choose and work with partial aspects of the course, with skills or clusters of skills. Thus, unlike the American Minicourses, the trainee does not need to work through the material step by step, from beginning to end, if he feels this unnecessary. Apart from this time-saving aspect, the opportunity for the trainees to compile a training program including the practical exercises (which meets their own intentions, and especially, functions within their insitutional possibilities) makes it easier to implement the Minicourses in differing systems of pre- and inservice teacher training.

4. The concentration solely on teaching skills in the Minicourses (here, teacher questioning skills) is widened to encompass general skills applicable to any human communication situation as it arises. This increases the range of possibilities in the implementation of the material to education institutions not concerned with teacher training, as well as to a variety of preservice programs.

Other Minicourses, after their commercial dissemination, are no longer accessible for modification or supplementation, due to the expense involved in the production of the materials. An open, flexible application of the courses as suggested here would make changes possible with greater ease and less cost. Beyond this, investigations carried out in the context of pre- and inservice programs, and concerning the more economic implementation, or simplification of such materials would make it economically feasible to alter materials or remove them from circulation. Thus, materials would not continue to be used merely because they were acquired at great expense.

This short description also outlines the framework for further training materials, developed partly following the American Minicourses, and partly independently developed on the basis of experiences gained from them. These materials draw (to varying degrees) near the TKF approach (see above) (1). They are meant to be available to those interested as a "library" from which they can select their individual training objectives.

Courses of this type require a great deal of initiative and activity on the part of the trainee. He/she must continually decide about the relevance of the offered information for himself and his own context; he/she is also required to constantly establish and revise his training objectives, and his learning and evaluation procedures.

---

(1) For a synposis of those materials, see p.3 .

References

K. A. Acheson/ P.E. Tucker, — Videotape Versus Written Instruction and Videotape Versus Audiotape Feedback in a Minicourse on Higher Cognitive Questioning. University of Oregon,1971.

K.A. Acheson/ C.J. Zigler, — Videotape Minicourse Versus Questioning Strategies Course Using Reading and Discussion. University of Oregon, 1971.

D.W. Allen/ K.A. Ryan, — Microteaching. Reading (Mass.), 1969.

E.J. Amidon/ N.A. Flanders, — The Role of the Teacher in the Classroom. Minneapolis, 1963.

E.J. Amidon/ N.A. Flanders, — Teacher Influence, Pupil Attitudes, and Achievement. In E.J. Amidon / J.B. Hough (eds.), Interaction Analysis : Theory, Research, and Application. Reading (Mass.) et al., 1967

B.S. Bloom (ed.), — Taxonomy of Educational Objectives. Handbook I : Cognitive Domain. New York,1956.

W.R. Borg, — The Balance Between Research and Development. In J.K. Hemphill/F.S. Rosenau (eds.), Educational Development. Berkeley, Eugene, 1973

W.R. Borg et al., — The Minicourse. A Microteaching Approach to Teacher Education. Beverly Hills (CA), 1970.

D.T. Campbell/ J.C. Stanley, — Experimental and Quasi-Experimental Designs for Research on Teaching. In N.L. Gage (ed.), Handbook of Research on Teaching. Chicago, 1963.

W. Doyle, — Paradigms in Teacher Effectiveness Research. Paper presented at the annual meeting of the American Educational Research Association, Washington D.C., 1975

M.J. Dunkin/ B.J. Biddle, — The Study of Teaching. New York et al., 1974

Far West Laboratory for Educational Research and Development (FWLERD), Minicourse 1: Effective Questioning, Elementary Level. Written and developed by W.R. Borg/M.L. Kelley/Ph. Langer, Beverly Hills, 1970.

Far West Laboratory for Educational Research and Development (FWLERD), Minicourse 4: Interaction Analysis. Operational Field Test Version. Written and developed by E. Werner/ R.A. Elder/J. Newman/M.Lai/J. Harano/ D. Walton/P. Barron, in consultation with N.A. Flanders, Berkeley, 1972.

Far West Laboratory for Educational Research and Development (FWLERD), Minicourse 9: Higher Cognitive Questioning. Written and developed by M.D. Gall/B. Dunning/ R. Weathersby, Beverly Hills, 1971.

N.A. Flanders, Teacher Influence, Pupil Attitudes, and Achievement. Washington D.C., 1965.

N.A. Flanders, Some Relationships Among Teacher Influence, Pupil Attitudes, and Achievement. In E.J. Amidon/J.B. Hough, Interaction Analysis : Theory, Research, and Application. Reading (Mass.) et al., 1967.

N.A. Flanders, Analyzing Teaching Behavior. Reading (Mass.) et al., 1970.

N.L. Gage/ D.C. Berliner, Educational Psychology. Chicago, 1975; 1979.

M.D. Gall/ B. Dunning/ J. Galassi/H. Banks, Main Field Test Report: Minicourse 9: Higher Cognitive Questioning. Report A 70-19. FWL. Berkeley, 1970.

M.D. Gall/ B. Dunning/ H. Banks/ J. Galassi, Comparison of Instructional Media in a Minicourse on Higher Cognitive Questioning. Paper presented at the meeting of the American Educational Research Association, Chicago, April, 1972.

M.D. Gall et al., The Effects of Variations in Microteaching on Prospective Teachers' Acquisition of Questioning Skills. Paper presented at the annual meeting of the American Educational Research Association, Chaicago, 1974.

G.M. Gazda, Human Relations Development. Boston, 1973.

J.K. Hemphill, Educational Research, Educational Development and Evaluation Studies. In J.K. Hemphill/F.S. Rosenau (eds.), Educational Development, Berkeley, Eugene, 1973.

J.K. Hemphill, The Relationship Between Research and Evaluation Studies. In J.K. Hemphill/F.S. Rosenau (eds.), Educational Development, Berkeley, Eugene, 1973.

C.A. van Houten, International Transfer of Educational Innovations: A Comparative Study of Minicourse Transfer Projects in Selected European Countries. Unpublished doctoral dissertation, Claremont Graduate School, Claremont, 1975.

A.E. Ivey, Microcounseling. Springfield (Ill.), 1972.

H.G. Klinzing (ed.), Lehrerhandbuch Interaktionsanalyse. Deutsche Version des Minicourse 4: Interaction Analysis. Tübingen 1972/1973 (mimeo).

H.G. Klinzing, Le Micro-Enseignement. Seminaire de Nancy, Nancy, 1974.

H.G. Klinzing, Die Integration von Skilltraining und Interaktionsanalyse in Kursen zum Training des Lehrverhaltens am Zentrum für Neue Lernverfahren der Universität Tübingen. In W. Zifreund (Hrsg.), Training des Lehrverhaltens und Interaktionsanalyse. Weinheim, 1976.

H.G. Klinzing, Das Microteaching-Verfahren, seine Elemente, und seine Organisation. In H.G. Klinzing/J. Mayer, Beiheft zu den Filmen 331860/331861 "Unterricht in Dokumenten", Microteaching/Training Kommunikativer Fertigkeiten zur Gesprächsführung und für Unterricht. Grünwald/Stuttgart, 1978.

H.G. Klinzing, Interagieren als Experimentieren. Ziele und Forschungsstrategien bei der Entwicklung eines Trainings Kommunikativer Fertigkeiten zur Gesprächsführung und für Unterricht. Unveröffentlichtes Manuskript. Tübingen, 1979.

G. Klinzing-Eurich/ H.G. Klinzing, Anfangsfertigkeiten des Fragenstellens. 1. Testversion. Tübingen, 1975 (mimeo).

H.G. Klinzing/
G. Klinzing-Eurich,
Die Verwendung elektronischer Datenverarbeitung in Verfahren schulpraktischer Lehrerausbildung. Unterrichtswissenschaft 3 ,1979.

H.G. Klinzing/
G. Klinzing Eurich,
Lehrfertigkeiten und ihr Training. Grafenau (in print).

H.J. Krumm,
Die internationale Adaption der "Minicourses" für die Lehrerbildung. Zeitschrift für Pädagogik 5, 1972.

R. Löffler,
Oberlegungen zur Adaptionsproblematik von Lehrsystemen am Beispiel von "Minicourse 9". Programmiertes Lernen, Unterrichtstechnologie und Unterrichtsforschung (pl) 4, 1972.

R.F. Peck/
J.A. Tucker,
Research on Teacher Education. In R.M.W. Travers (ed.), Second Handbook of Research on Teaching. Chicago, 1973.

A. Perlberg,
Recent Approaches on Micro-Teaching and A.ied Techniques which can be Implemented Easily in Developing Countries. Paper presented to the United Nations Educational, Scientific, and Cultural Organization, ED-75/WS/50, July 1975.

B. Rosenshine,
Teaching Behaviours and Student Achievement. London, 1971.

H.J. Störig (ed.),
Das Problem des Obersetzens. Darmstadt, 1973.

Ph.H. Winne,
Experiments Relating Teachers' Use of Higher Cognitive Questions to Student Achievement. Review of Educational Research, 1978.

W. Zifreund,
Konzept für ein Trainin.g des Lehrverhaltens mit Fernseh-Aufzeichnungen in Kleingruppen-Seminaren. Berlin, 1966.

W. Zifreund,
Training des Lehrverhaltens und Micro-Teaching: individualisierende Verwendungsmöglichkeiten des Fernsehens in Kleingruppen. In W. Zifreund (ed.), Schulmodelle, Programmierte Instruktion und Technische Medien. München, 1968.

W. Zifreund,
Training des Lehrverhaltens mit Fernseh-Aufzeichnungen. "Microteaching" als Beitrag zu einer Reform der Lehrerausbildung. In betrifft erziehung 3, 1970.

W. Zifreund (ed.),
Training des Lehrverhaltens und Interaktionsanalyse. Weinheim/Basel, 1976.

Appendix No.1

SUMMARY CHART OF QUESTION TYPES (1)

Question Type	Student Activity	Examples
Knowledge	Recalling facts or observations. Recalling definitions.	1. *Who?* 2. *What?* 3. *Where?* 4. *When?* 5. *Why?* (if cause is given.) 6. *Define* (the word *gubernatorial*).
Comprehension	Giving descriptions. Stating main ideas. Comparing.	1. *Describe* (what happened in our experiment). 2. *What is the main idea* (of this paragraph)? 3. *How are* (these two countries) *alike?* *How are they different?*
Application	Applying techniques and rules to solve problems that have a single correct answer.	1. *If* (Bill has 49 cents), *how many* (8-cent balloons) *can he buy?* 2. *What is* (the latitude of Moscow)? 3. *Classify* (these poems as ballads, sonnets, or odes).
Analysis	Identifying motives or causes. Making inferences. Finding evidence to support generalizations.	1. *Why* (did the Bat-Poet write poems)? 2. *Now that we've studied this, what can we conclude about* (life in Germany)? 3. *What does this tell us about* (the author's attitude toward war?) 4. *What evidence can you find to support* (the principle that air expands when heated)?
Synthesis	Solving problems. Making predictions. Producing original communications.	1. *Can you think up* (a title for this drawing)? 2. *How can we solve* (this dilemma)? 3. *How can we improve* (our experiment)? 4. *What will happen* (now that we've landed on the moon)? 5. *What do you predict would happen* (if this lake were to run dry)?
Evaluation	Giving opinions about issues. Judging the validity of ideas. Judging the merit of problem-solution. Judging the quality of art and other products.	1. *Do you agree* (with Kathy)? 2. *Do you believe* (that this is the best way to proceed)? 3. *Do you think* (that it is right to execute convicted murderers)? 4. *What is your opinion* (on this matter)? 5. *Would it be better* (to do it this way)? 6. *Which* (painting) *do you like?*

(1) M.D.Gall et al.: Minicourse 9:
Higher Cognitive Questioning,1971,p.261.

Results from the questionnaires — Appendix 2:

Preliminary Remarks:

The evaluation is based upon the questionnaires from the participants of both studies who completed the course in the form described above.

The questions in the questionnaires handed-out were arranged in a different sequence than in the following tables. Questions 5, 6, 8, 15, 18, 19, 29 to 39, 57 and 58 are translated from those questions used for the evaluation of Minicourse 9 at FWLERD (Gall et al. 1970); questions 3, 48, 49, 50 and 51 come from the questionnaire by B.E. Ward (1969), as translated by G.E. Becker (1973). The scales of these questions were left in their original versions, since they were thus easier to compare.

Some questions could not be answered by the participating groups (reading group, study I; teaching candidates, study II); in addition, some questions were not filled out by certain participants, and therefore the number of answers differs from one question to another.

The following tables show the response frequencies of those questions in the concluding questionnaire as a percentage, as well as the arithmetic mean, used as a rough descriptive statistic, for both participating groups (video group n = 19; reading group n = 23) and the entire group of study I, and for the group of study II. Furthermore, for study I U-tests were used for the testing of the significance of differences between the video group and the reading group ($p \leq 0.01$).

1.) On the whole I consider the course as

very positive — very negative

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	26.32	36.84	15.79	15.79	5.26	-	-	-1.02 ns	2.36
	Reading group	23	8.70	39.13	37.78	13.04	4.35	-	-		2.65
	Total group	42	16.67	38.10	26.19	14.29	4.76	-	-		2.52
II		45	11.11	46.67	40.00	8.89	2.22	-	-		2.62

2.) I consider the training of teaching behavior as carried out in the course to be

very important — very unimportant

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	42.11	31.58	21.05	5.26	-	-	-	-0.49 ns	1.89
	Reading group	23	34.78	34.78	21.74	8.70	-	-	-		2.04
	Total group	42	38.10	33.33	21.43	7.14	-	-	-		1.97
II		45	13.33	48.89	33.33	-	4.44	-	-		2.33

3.) Did you learn any methods from which you expect any improvement in your teaching?

Yes — No

		n	1	2	u-Test
I	Video group	19	89.47	10.53	0.76 ns
	Reading group	23	95.65	4.35	
	Total group	42	92.65	7.14	
II		45	100.00	-	

* : $p \leq 0.01$ (two-tail)

4.) Independent activity has

been greatly furthered by the course — not been furthered at all by the course

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	10.53	36.84	47.37	-	5.26	-	-	-2.32 ns	2.52
	Reading group	23	-	17.39	60.87	17.39	4.35	-	-		3.08
	Total group	42	4.76	26.19	54.76	9.52	4.76	-	-		2.83
II		45	2.22	8.89	37.78	31.11	11.11	6.67	2.22		3.87

5.) As compared to your college (preservice) education courses, how would you rate Minicourse 9 ?

much better than — much worse than

		n	1	2	3	4	5	u-Test	$\bar{x}$
I	Video group	19	26.32	52.63	21.05	-	-	0.35 ns	1.94
	Reading group	23	26.09	60.87	13.04	-	-		1.87
	Total group	42	26.19	57.14	16.67	-	-		1.90
II		40	5.00	65.00	22.50	5.00	2.50		2.35

6.) As compared to other inservice education experiences, how would you rate Minicourse 9 ?

much better than — much worse than

		n	1	2	3	4	5	u-Test	$\bar{x}$
I	Video group	19	15.79	57.89	26.32	-	-	0.62 ns	2.10
	Reading group	23	34.78	34.78	30.43	-	-		1.95
	Total group	42	26.19	45.24	28.57	-	-		2.02
II		45	13.33	66.67	17.78	2.22	-		2.08

ns : $p \leq 0.01$ (two-tail)

7.) My capacity for leading classroom discussions has been

greatly improved by the course — has not been improved at all by the course

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	31.58	42.11	15,79	10.53	-	-	0.02 ns	3.05
	Reading group	23	-	30.43	43.48	21.74	-	-	4.35		3.08
	Total group	42	-	30.95	42.86	19,05	4.76	-	2.38		3.07
II		45	-	15.56	46.67	26.67	4.44	6.67	-		3.40

8.) To what extent has Minicourse 9 helped you improve your overall teaching ?

considerable improvement — no improvement

		n	1	2	3	4	5	u-Test	$\bar{x}$
I	Video group	19	10.53	57.89	26.32	5.26	-	1.69 ns	2.26
	Reading group	23	17.39	73.91	8.70	-	-		1.91
	Total group	42	14.29	66.67	16.67	2.38	-		2.07
II		43	-	62.79	37.29	-	-		2.37

9.) I believe that the pupils' attitude towards my teaching behavior will change after the course.

it will improve greatly — it will become much worse

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	26.32	42.11	31.58	-	-	-	-1.03 ns	3.05
	Reading group	23	-	17.39	39.13	34.78	4.35	4.35	-		3.39
	Total group	42	-	21.43	40.48	33.33	2.38	2.38			3.23
II		45	-	6.67	35.56	57.78	-	-	-		3.51

s : $p \leq 0.01$ (two-tail)

10.) I believe that my taking part in the course will have a positive effect on the achievement of my pupils.

this statement is very true — this statement is very incorrect

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	26.32	42.11	31.58	-	-	-	-1.56 ns	2.84
	Reading group	23	-	26.09	30.43	26.09	17.39	-	-		3.38
	Total group	42	-	30.95	38.10	19.05	11.90	-	-		3.11
II		45	2.22	6.67	44.44	37.78	-	6.67	2.22		3.56

11.) I consider the participation in a course of this kind as

very helpful for my professional development — very detrimental to my professional development

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	21.05	36.84	21.05	21.05	-	-	-	-0.92 ns	2.42
	Reading group	23	-	52.17	26.09	21.74	-	-	-		2.69
	Total group	42	9.52	45.24	23.81	21.43	-	-	-		2.57
II		45	11.11	17.78	46.67	24.44	-	-	-		2.84

12.) Assuming that according to the criteria of the course my questioning attitude has changed this will have a positive influence on my superior's evaluation of my professional work.

very much so — not at all so

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	5.26	15.79	52.63	15.79	-	10.53	-2.24 ns	4.21
	Reading group	23	-	-	4.35	34.78	30.43	26.09	4.35		4.91
	Total group	42	-	2.38	9.52	42.86	23.81	14.29	7.14		4.59
II		45	6.67	28.89	26.67	26.67	8.89	-	2.22		3.11

a : $p \leq 0.01$ (two-tail)

13.) Training of teaching behavior only means adaptation to the value system of one's society

completely wrong — very true

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	10.53	26.32	15.79	21.05	15.79	10.53	-	0.43 ns	3.36
	Reading group	23	21.74	21.74	13.04	17.39	13.04	13.04	-		3.17
	Total group	42	16.67	23.81	14.29	19.05	14.29	11.90	-		3.26
II		45	4.44	11.11	15.55	11.11	8.89	31.11	17.78		4.73

14.) The time it takes to work through the learning materials

was very much worth it — was not worth it at all

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	52.63	26.32	15.79	-	5.26	-	-1.54 ns	2.78
	Reading group	23	4.35	21.74	34.78	30.43	4.35	4.35	-		3.21
	Total group	42	2.38	35.71	30.95	23.81	2.38	4.76	-		3.02
II		45	8.89	26.67	33.33	22.22	6.67	2.22	-		2.64

15.) In learning the course skills the teacher handbook was

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	52.63	47.37	-	-	-0.02 ns	1.47
	Reading group	23	52.17	47.83	-	-		1.47
	Total group	42	52.38	47.62	-	-		1.47
II								

ns : $p \neq 0.01$ (two-tail)

16.) The instructional parts were

very easy to understand — very difficult to understand

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	5.26	42.11	36.84	5.26	10.53	-	-	-0.49 ns	2.73
	Reading group	23	4.35	34.78	39.13	17.39	4.35	-	-		2.82
	Total group	42	4.76	38.10	38.10	11.90	7.14	-	-		2.78
II		45	11.11	55.55	20.00	11.11	2.22	-	-		2.38

17.) The instructional parts were

very clear — very confusing

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	15.79	63.16	10.53	5.26	5.26	-	-	-2.26 ns	2.21
	Reading group	23	4.35	43.48	13.04	21.74	17.39	-	-		3.04
	Total group	42	9.52	52.38	11.90	14.29	11.90	-	-		2.66
II		45	13.33	57.78	22.22	4.44	2.22	-	-		2.24

18.) In learning the course skills the instructional lessons (taped or written) were

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	36.84	57.89	5.26	-	-0.91 ns	1.68
	Reading group	23	21.74	73.91	4.35	-		1.86
	Total group	42	28.57	66.67	4.76	-		1.76
II		43	23.25	74.42	2.32	-		1.79

19.) In learning the course skills the model lesson (taped or written) was

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	36.84	52.63	10.53	-	-0.79 ns	1.73
	Reading group	23	21.74	69.57	8.70	-		1.87
	Total group	42	28.57	61.90	9.52	-		1.81
II		41	21.95	66.67	4.87	-		1.83

20.) The films are

very meaningful — of no account

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	15.79	26.32	47.37	10.53	-	-		3.52

21.) The introductional film was

very good — very bad

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	-	21.05	57.89	10.53	10.53	-	-1.53 ns	4.10
	Reading group	23	-	-	17.39	34.78	17.39	21.74	8.70		4.69
	Total group	42	-	-	19.05	45.24	14.29	16.67	4.76		4.42
II											

a : $p \leq 0.01$ (two-tail)

22.) I consider the model and instructional films as

very illustrative — not illustrative at all

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	-	15.79	73.68	1.53	-	-		3.94

23.) The model and instructional films had

a great learning effect on me — absolutely no learning effect on me

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	-	21.05	52.63	10.53	15.79	-		4.21

24.) I consider the model and instructional films to be

very interesting — very boring

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	-	10.53	63.16	26.32	-	-		4.15

25.) The instructional films were

totally satisfactory — very much in need of revision

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	-	26.32	63.16	10.53	-	-		3.84

a : $p \leq 0.01$ (two-tail)

26.) The evaluation forms were

very meaningful to me — very meaningless to me

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	26.32	42.11	5.26	15.79	5.26	5.26	-3.22	3.47
	Reading group	23	-	-	21.74	13.04	26.09	8.70	30.43	-	5.13
	Total group	42	-	11.90	30.95	9.52	21.43	7.14	19.05		4.38
II											

27.) The evaluation forms

took relatively little time to complete — were easy to complete

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	10.53	10.53	31.58	31.58	15.79	-	-	-1.84 ns	3.31
	Reading group	23	4.35	13.04	26.09	-	26.09	17.39	13.04		4.34
	Total group	42	7.14	11.90	28.57	14.29	21.43	9.52	7.14		3.88
II											

28.) What role does questioning play in my professional training?

a very central one — of no importance

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	5.26	21.05	47.37	15.79	10.53	-	-	1.75 ns	3.05
	Reading group	23	8.70	52.17	21.74	8.70	4.35	-	4.35		2.65
	Total group	42	7.14	38.10	33.33	11.90	7.14	-	2.38		2.83
II		45	31.11	31.11	17.78	11.11	8.89	-	-		2.36

a : $p \leq 0.01$ (two-tail)

29.) Evaluation questions: Giving opinions about issues

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	52.63	47.37	-	-	0.24 ns	1.47
	Reading group	23	56.52	43.38	-	-		1.43
	Total group	42	54.76	45.24	-	-		1.45
II		37	40.54	31.35	5.40	2.70		1.70

30.) Synthesis questions: Problem solving

very useful — detrimental

		n	I	2	3	4	u-Test	$\bar{x}$
I	Video group	19	84.21	15.79	-	-	-1.09 ns.	1.15
	Reading group	23	69.57	30.43	-	-		1.30
	Total group	42	76.19	23.81	-	-		1.23
II		38	65.79	34.21	-	-		1.34

31.) Analysis questions: Finding motives and explanations

very useful — detrimental

		n	I	2	3	4	u-Test	$\bar{x}$
I	Video group	19	47.37	52.63	-	-	1.74 ns	1.52
	Reading group	23	73.91	26.09	-	-		1.26
	Total group	42	61.90	38.10	-	-		1.38
II		38	71.05	36.31	-	-		1.24

ns : $p \leq 0.01$ (two-tail)

35.) Making inferences

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	31.58	68.42	-	-	1.59 ns	1.68
	Reading group	23	56.52	43.48	-	-		1.43
	Total group	42	45.24	54.76	-	-		1.54
II		35	54.29	26.67	11.43	-		1.57

36.) Evaluating and improving the quality of student answers

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	89.47	10.53	-	-	0.19 ns	1.10
	Reading group	23	91.30	8.70	-	-		1.08
	Total group	42	90.48	9.52	-	-		1.09
II		40	67.50	27.50	5.00	-		1.38

37.) Making predictions

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	73.68	26.32	-	-	0.01 ns	1.26
	Reading group	23	73.91	26.09	-	-		1.26
	Total group	42	73.81	26.19	-	-		1.26
II		36	61.11	36.11	2.78	-		1.42

a : $p \leq 0.01$ (two-tail)

38.) Judging the quality of art and other products

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	68.42	31.58	-	-	1.06 ns	1.31
	Reading group	23	82.61	17.39	-	-		1.17
	Total group	42	76.19	23.81	-	-		1.23
II		37	67.57	32.43	-	-		1.32

39.) Producing original communications

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group		36.84	63.14	-	-	1.25 ns	1.63
	Reading group		56.52	43.48	-	-		1.43
	Total group		47.62	52.38	-	-		1.52
II		27	14.81	44.44	37.04	3.70		2.30

40.) The training of separate teaching skills is

very important for my teaching behavior — of no importance at all for my teaching behavior

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	26.32	52.63	15.79	5.26	-	-	-	-1.65 ns	2.00
	Reading group	23	17.39	30.43	47.83	4.35	-	-	-		2.39
	Total group	42	21.43	40.48	33.33	4.76	-	-	-		2.21
II		45	24.44	35.56	33.33	6.67	-	-	-		2.22

a : $p \leq 0.01$ (two-tail)

41.) I think that the training of separate teaching skills is

very easily transferable — not at all transferable

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	21.05	52.63	21.05	-	5.26	-	-	-1.09 ns	2.15
	Reading group	23	8.70	52.17	34.78	4.35	-	-	-		2.34
	Total group	42	14.29	52.38	28.57	2.38	2.38	-	-		2.26
II		45	13.33	51.11	20.00	13.33	-	-	2.22		2.44

42.) With Microteaching you concentrate on only one or a few teaching skills. This I consider very effective

very effective — very ineffective

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	15.79	47.37	15.79	10.53	10.53	-	-	0.56 ns	2.52
	Reading group	23	30.43	30.43	17.39	21.74	-	-	-		2.30
	Total group	42	23.81	38.10	16.67	16.67	4.76	-	-		2.40
II		45	37.78	33.33	26.67	2.22	-	-	-		1.93

43.) The theoretical background knowledge contained in the course was

extensive — very scarce

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	26.32	36.84	21.05	-	15.79	-	1.85 ns	3.42
	Reading group	23	4.35	43.48	39.13	4.35	4.35	4.35	-		2.73
	Total group	42	2.38	35.71	38.10	11.90	2.38	9.52	-		3.04
II		45	2.22	11.11	20.00	26.67	17.78	20.00	2.22		4.16

x : $p \leq 0.01$ (two-tail.)

44.) The course has

greatly increased my knowledge — not increased my knowledge at all

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	26.32	42.11	26.32	5.26	-	-	1.64 ns	3.10
	Reading group	23	-	43.48	47.83	4.35	4.35	-	-		2.69
	Total group	42	-	35.71	45.24	14.29	4.76	-	-		2.88
II		45	6.67	24.44	33.33	20.00	13.33	-	-		3.16

45.) I consider that in order to be a "good teacher" acquiring theoretical knowledge about teaching is

very important — very irrelevant

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	52.63	31.58	15.79	-	-	-	-	-0.37 ns	1.63
	Reading group	23	47.83	34.78	8.70	4.35	4.35	-	-		1.82
	Total group	42	50.00	33.33	11.90	2.38	2.38	-	-		1.73
II		45	26.67	37.78	20.00	6.67	6.67	4.44	-		2.49

46.) The theoretical statements in the course are

very relevant — irrelevant

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	36.84	42.11	10.53	10.53	-	-	0.85 ns	2.94
	Reading group	23	4.35	43.48	34.78	17.39	-	-	-		2.65
	Total group	42	2.38	40.48	38.10	14.29	4.76	-	-		2.78
II		45	2.22	13.33	28.89	33.33	17.78	4.44	-		3.64

x : $p \leq 0.01$ (two-tail)

47.) The background knowledge to the course was

very easily transferable into a concrete situation — not at all transferable into a concrete situation

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	10.53	15.79	47.37	15.79	10.53	-	-	0.98 ns	3.00
	Reading group	23	-	56.52	17.39	17.39	8.70	-	-		2.78
	Total group	42	4.76	38.10	30.95	16.67	9.52	-	-		2.88
II		45	4.44	15.56	26.67	31.11	8.89	4.44	-		3.56

48.) Do you think that Microteaching is one of the many innovations that will not last?

No — Yes

		n	1	2	u-Test
I	Video group	19	89.47	10.53	-0.95 ns
	Reading group	23	78.26	21.74	
	Total group	42	83.33	16.67	
II		45	88.88	11.11	

49.) Do you think that the Microteaching method could be replaced by another training method which might be simpler ?

No — Yes

		n	1	2	u-Test
I	Video group	19	73.68	26.32	-1.14 ns
	Reading group	23	56.52	43.48	
	Total group	42	64.29	35.71	
II		38	63.15	36.84	

x : p ≤ 0.01 (two-tail)

50.) Did you feel unsafe or inhibited during Microteaching sessions ?

No Yes

		n	1	2	u-Test
I	Video group	19	100.00	00.00	-1.30 ns
	Reading group	23	91.30	8.70	
	Total group	42	95.24	4.76	
II		41	90.24	9.76	

51.) Would you like to have some more training possibilities ?

Yes No

		n	1	2	u-Test
I	Video group	19	100.00	00.00	-1.30 ns
	Reading group	23	91.30	8.70	
	Total group	42	95.24	4.76	
II		45	88.88	11.11	

52.) In comparison to a normal teaching situation I consider the Microteaching method as

very close to the real situation very artificial

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	10.53	15.79	21.05	26.32	15.79	10.53	-0.28 ns	4.52
	Reading group	23	-	17.39	17.39	4.35	21.74	26.09	13.04		4.60
	Total group	42	-	14.29	16.67	11.90	23.81	21.43	11.90		4.57
II		45	6.67	17.78	20.00	11.11	22.22	17.78	4.44		3.96

s : $p \leq 0.01$ (two-tail)

53.) I consider the reduction of time in Microteaching sessions as

not disturbing — very disturbing

		n	1	2	3	4	5	6	7	U-Test	$\bar{x}$
I	Video group	19	21.05	36.84	15.79	10.53	10.53	5.26	-	-1.04 ns	2.68
	Reading group	23	21.74	21.74	8.70	17.39	8.70	21.74	-		3.34
	Total group	42	21.43	28.57	11.90	14.29	9.52	14.29	-		3.04
II		45	35.56	20.00	8.89	[illegible]	6.67	4.44	2.22		2.67

54.) I consider the reduction of time in Microteaching sessions as

very helpful — not helpful at all

		n	1	2	3	4	5	6	7	U-Test	$\bar{x}$
I	Video group	19	31.58	10.53	31.58	10.53	5.26	5.26	5.26	-1.50 ns	2.84
	Reading group	23	8.70	26.09	13.04	17.39	17.39	17.39	-		3.60
	Total group	42	19.05	19.05	21.43	14.29	11.90	11.90	2.38		3.26
II		45	6.67	28.89	22.22	22.22	6.67	8.89	4.44		3.38

55.) By teaching in small groups I learned

very much — nothing at all

		n	1	2	3	4	5	6	7	U-Test	$\bar{x}$
I	Video group	19	15.79	36.84	31.58	5.26	10.53	-	-	-2.13 ns	2.57
	Reading group	23	-	17.39	56.52	17.39	4.35	4.35	-		3.21
	Total group	42	7.14	26.19	45.24	11.90	7.14	2.38	-		2.92
II		44	2.27	6.81	25.00	33.33	27.27	2.27	2.27		3.93

s : $p \leq 0.01$ (two-tail)

56.) The reteach had

a great learning effect on me — no learning effect on me

		n	1	2	3	4	5	6	7	u-Test	$\bar{x}$
I	Video group	19	-	31.58	36.84	26.32	-	-	5.26	-1.46 ns	3.15
	Reading group	23	4.35	21.74	13.04	39.13	-	8.70	13.04		3.87
	Total group	42	2.38	26.19	23.81	33.33	-	4.76	9.52		3.54
II											

57.) In learning the course skills the reteach was

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	31.58	52.63	15.79	-	-0.75 ns	1.84
	Reading group	23	21.74	56.52	21.74	-		2.00
	Total group	42	26.19	54.76	19.05	-		1.92
II								

58.) In learning the course skills the viewing of (listening to) one own's tape was

very useful — detrimental

		n	1	2	3	4	u-Test	$\bar{x}$
I	Video group	19	52.63	42.11	5.26	-	0.00 ns	1.52
	Reading group	23	52.17	43.48	4.35	-		1.52
	Total group	42	52.38	42.86	4.76	-		1.52
II		33	39.39	54.55	6.06	-		1.39

a : $p \leq 0.01$ (two-tail)

57.) The use of a camera in Microteaching sessions

did not inhibit me at all — inhibited me very much

		n	1	2	3	4	5	6	7	U-Test	$\bar{x}$
I	Video group	19	31.58	26.32	21.05	15.79	5.26	-	-	2.83*	2.36
	Reading group	23	73.91	17.39	4.35	-	4.35	-	-		1.43
	Total group	42	54.76	21.43	11.90	7.14	4.76	-	-		1.85
II											

* : p = 0.01 (two-tail)